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**LEGISLATIVE XML:  
Principles and Technical Tools**

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Fabio Vitali, Department of Computer Science, University of Bologna  
Translated by German Gomez Ventura, European University Institute**

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## INTRODUCTION

This document, commissioned by the Inter-American Development Bank (IDB) and developed by the University of Bologna<sup>1</sup>, presents the advantages, opportunities, and challenges involved in applying Legislative XML to a parliamentary workflow. It is addressed to a diverse audience of experts involved in the parliamentary lawmaking system. In particular, there are five groups of final end users.

**Members, legislative leaders, and other decision-makers.** The goal here is to enable this group to have an appreciation of how Legislative XML and its tools work and what it can achieve in the work of the legislature, as well as in policymaking and in communicating with voters and citizens (Part I).

**Legislative officers and senior legislative clerks.** It is important for those in this group to understand the basic concepts of Legislative XML standards and the way its corresponding tools can help legislative officers streamline their work. The goal of using XML being to optimize the legislative process, improve interoperability, minimize the costs, and maximize the effectiveness; thus improving the overall process and making it more accurate (Parts I and II).

**Drafters and legislative clerks.** These practitioners must be able to connect legal drafting techniques (legislative/technical manuals) with best practices in Legislative XML markup, to analyze legislative documents from different perspectives so as to capture the semantic parts of these texts, while preserving the linguistic aspects of the legislative-drafting activity. It is fundamental for this group to understand which tools are available on the market to implement XML and which are the benefits this can bring to their work (Parts III and IV).

**ICT managers and staff responsible for the technology used to create and maintain legislative documents.** There is a need to increase technical understanding of Legislative XML, its strengths and weaknesses, provide the skill set needed by ICT staff to build and support Legislative XML applications, and understand the technical and organizational challenges involved in implementing XML in a legislative environment (Parts II and III).

**ICT developers.** This is the group entrusted with creating, implementing, and supporting the technical applications used to produce and maintain legislative documents. Those in this group need to understand the main technical specifications to develop ICT solutions that are compliant with the Legislative XML approach. They can also draw inspiration from the tools presented here (Parts II, III, and IV).

The document is organized so as to enable readers from the audience to browse directly to the parts that interest them:

- Part I offers a general introduction of the benefits and challenges of Legislative XML;
- Part II introduces the Legislative XML characteristics with particular regard to the Akoma Ntoso standard;
- Part III presents the tools in support of XML markup; and
- Part IV illustrates how to apply Akoma Ntoso and moreover how to mark up a legal document respecting the legal semantic of each textual part.

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<sup>1</sup> CIRSFID and the Department of Computer Science, University of Bologna.



# PART I

## Opportunities and Challenges of Legislative XML

### 1. Introduction to XML

#### 1.1 What Is XML?

XML (Extensible Markup Language) is an open-standard markup language developed by the W3C<sup>2</sup> (www.w3.org) and extensively adopted worldwide to represent data and documents.

The main idea behind XML is to enclose the text within annotation elements, or tags<sup>3</sup>, which serve to label the text. Just as on paper we use a colored marker to highlight the parts of a text that we want to single out, in XML we use bookmarks, notes, and qualifications to single out different parts of a text as having this or that meaning. In the following example, the *docType* tag identifies the type of legislative document, the *docDate* tag gives the date of enactment, and the *docTitle* tag contains the law’s full title. Thus, for example, we can ask the system to find all 2010 laws that contain “collective property” in the title.

```

<preface>
  <subdivision>
    <docProponent>Republic of Panama</docProponent>
    <docProponent>Ministry of Agricultural Development </docProponent>
    <docType>Executive Order</docType>
    <docNumber>n. 223</docNumber>
    <docDate date="2010-06-29">(Of 29 June 2010)</docDate>
    <docTitle>Which regulates Law 72 of 2008 establishing the special procedure for the award
of the collective property of indigenous peoples' lands that are not within the counties.</docTitle>
  </subdivision>
</preface>

```

Figure 1 – XML fragment.

The XML permits also to add metadata about the document, coordinated with the structure of the text, in order to add information not directly included in the narrative. In the meantime, XML allows to perform a semantic query like this: “give me all the documents that talk about <Agrarian Reform>” within the articles in force in 2009”. This is possible even if those words are not included in the text of article 2:

<pre> &lt;classification source="#library"&gt;   &lt;keyword id="keyword1" value="agrarianReform" showAs="Agrarian Reform" dictionary="Tesauro"/&gt; &lt;/classification&gt; </pre>	Metadata
<pre> &lt;article id="art2" refersTo="#keyword1"&gt;   &lt;num&gt;Artículo 2:&lt;/num&gt;   &lt;clause id="art2-cl1"&gt;     &lt;content&gt;       &lt;p&gt; </pre>	Structure of the Text with the connection to the


<sup>2</sup> <http://www.w3.org/>

<sup>3</sup> The tag is composed by two parts: opening tag (<docTitle>) and closing tag (</docTitle>). The name of the opening and closing tags is equal but they are case sensitive (doctitle is different from docTitle). The symbolic characters <, >, / are used for isolating the tag from the other part of the content to markup. The part of the content is enclosed inside of the opening and the closing tags. Example: <docTitle> this is a text </docTitle>.

<p>The collective title application must be accompanied by the following documents and information:</p> <ol style="list-style-type: none"> <li>1. The plan or sketch of the area to the holder.</li> <li>2. The certificate issued by the General of the Republic Contaloría with the census population of the community.</li> <li>3. Certification by the Indigenous Policy Directorate of the Ministry of Government and Justice, which proves the existence of the community or communities applicants.</li> <li>4. Name and general information about the authority or person making the request on behalf of the short cut or indigenous communities adjoining surface and location of the land.</li> </ol> <p>&lt;/p&gt; &lt;/content&gt; &lt;/clause&gt; &lt;/article&gt;</p>	<p>classificatory keyword</p>
--	-------------------------------

Figure 2 – Classification of the text.

- **XLM is an open-source format for data and documents**, meaning that no one company owns the copyright. The format is documented and shared within the IT community, and it is delivered through an open-source license.
- **XML is machine readable**. The example presented in the tables below shows how XML documents can be understood by both humans and computers.

<p><b>THE OFFICIAL GAZETTE 27<sup>TH</sup> JANUARY, 2009</b> <b>LEGAL SUPPLEMENT — C</b></p> <hr/> <p><b>BILL No. 5 of 2009</b> <i>Tuesday 27<sup>th</sup> January, 2009</i></p> <p>PARLIAMENT OFFICE Public Buildings, Georgetown, Guyana. 27<sup>th</sup> January, 2009.</p> <p>The following Bill which will be introduced in the National Assembly is published for general information.</p> <p><i>S.E. James,</i> Clerk of the National Assembly.</p>  <p><b>GUYANA</b> <b>BILL No. 5 of 2009</b> <b>STATUS OF CHILDREN BILL 2009</b> <b>ARRANGEMENT OF SECTIONS</b></p>	<p>Document view by user</p>
--	------------------------------

<pre> &lt;?xml version="1.0" encoding="UTF-8"?&gt; &lt;!-- edited with XMLSPY v5 rel. 4 U (http://www.xmlspy.com) by Cirsfid (A) &lt;?xml-stylesheet type="text/xsl" href="akomantoso.xsl"?&gt; &lt;akomaNtoso xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance" ./akomantoso20.xsd" xmlns="http://www.akomantoso.org/2.0"&gt;   &lt;documentCollection name="bill"&gt;     &lt;meta&gt;       &lt;identification source="#bungeni"&gt;         &lt;FRBRWork&gt;           &lt;FRBRthis value="/gy/bill/2009-01-27/5/main"/&gt;           &lt;FRBRuri value="/gy/bill/2009-01-27/5/"&gt;           &lt;FRBRdate date="2009-01-27" name="Enactment"/&gt;           &lt;FRBRauthor href="#parliament" as="#author"/&gt;         &lt;/FRBRWork&gt;         &lt;FRBRExpression&gt;           &lt;FRBRthis value="/gy/bill/2009-01-27/5/eng@/main"/&gt;           &lt;FRBRuri value="/gy/bill/2009-01-27/5/eng@"&gt;           &lt;FRBRdate date="2011-12-19" name="Expression"/&gt;           &lt;FRBRauthor href="#palmirani" as="#editor"/&gt;         &lt;/FRBRExpression&gt;         &lt;FRBRManifestation&gt;           &lt;FRBRthis value="/gy/bill/2009-01-27/5/eng@/main.xml"/&gt;           &lt;FRBRuri value="/gy/bill/2009-01-27/5/eng@/main.akn"/&gt;           &lt;FRBRdate date="2011-12-19" name="XMLConversion"/&gt;           &lt;FRBRauthor href="#user.palmirani" as="#editor"/&gt; </pre>	<p>Document view by computer</p>
---	----------------------------------

Figure 3 – XML document example: end-user visualization and code.

- **XML is technology-neutral.** XML can be used with any open-source program or simply with a non-proprietary editor. In this regard, the parliament will not be tied to any one product to process its data and documents, and investments can be made in a technology that so far do not depend on the software applications on the market. This implies that we will no longer find that we cannot open a document just because the application we use is outdated and its use depends on updating or buying a new product in the market.
- **XML identifies the purpose and content of the information** and can be used for multiple purposes such as searching and preservation as well as for presentation on multiple devices. It therefore has more capabilities than HTML.
- **XML is machine-readable.** Unlike PDF, the semantic of each part of the XML file can be understood by a computer that is able to manipulate any fragment of the document. In fact, the tags help the computer to understand the meaning of the marker-defined values. For example, if you enclose an article’s contents in the “article” tag, the computer will recognize all parts of the text having a normative value.
- **XML is hierarchical,** rigorous, extensible, more accurate, and flexible. Because XML is a language of languages, each community can build its own vocabulary of tags depending on the problem to be solved. On the legislative front, there are families of Legal XML standards that have emerged to capture the peculiarities of legal and legislative documents. At the same time, XML is rigorous, because like any natural language it uses lexicon and syntax (i.e., a grammar) to define its own rules. This way it defines a behavioral rule for a tag (requiring, for example, that all paragraphs be numbered). It is impossible for the user to infringe this rule because the program will check if the XML is correct, thus detecting any errors. This requires the user to strictly observe the standardization and harmonization rules, in such a way that the resulting document is more accurate.

```

- <akomaNtoso xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance" xsi:schemaLocatio
xmlns="http://www.akomantoso.org/1.0">
- <documentCollection>
+ <meta>
- <collectionContent>
- <bill>
+ <meta>
+ <preface>
+ <preamble>
+ <body>
</bill>
- <interstitial id="int1">
<p>The following document is the MEMORANDUM OF OBJECTS AND REASONS</p>
</interstitial>
- <doc name="memorandum">
+ <meta>
+ <preface>
+ <mainContent>
+ <conclusions>
</doc>
- <doc name="amendmendArticle">
+ <meta>
+ <preface>
+ <mainContent>
</doc>
</collectionContent>
</documentCollection>
</akomaNtoso>

```

**Bill**

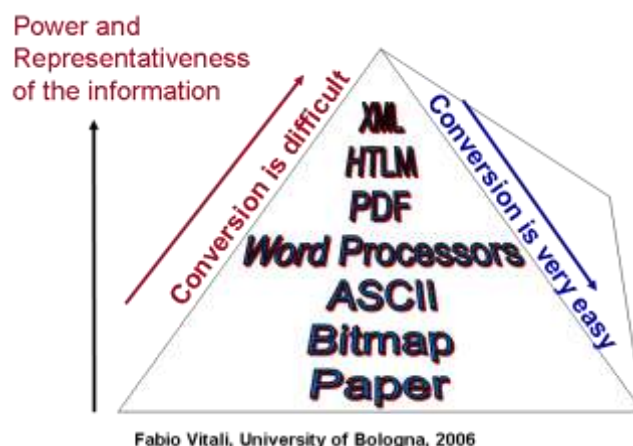
**Motivations**

**Annex**

Figure 4 – Example of hierarchical elements: the bill forms the core of the prologue. Thus, I can extract the entire bill and use it as such in other documents while retaining its mark-up and structure.

- **XML ensures the long term preservation and accessibility of the document.** Because XML is an open-source, *open* markup language, it is an optimum data format for storing information over the long term, as is so often necessary when dealing with legislative and legal information. The format is designed so that we can access legal documents a hundred years from now without having to worry about finding the software that will read them.

XML was born in 1996 in an attempt to overcome the limitations of HTML and in an effort to make the language of markers more rigorous. As compared to other formats, XML has a high expressive value, and once a document is converted into XML, it can easily be converted into any other format, as shown in the pyramid figure below.



Fabio Vitali, University of Bologna, 2006

Figure 5 – Pyramid of different formats.

The higher up in the pyramid, the more valuable the information being carried is and the greater its potential reuse; even if it takes more time to convert that information from paper into XML.

## 1.2 How to Use XML

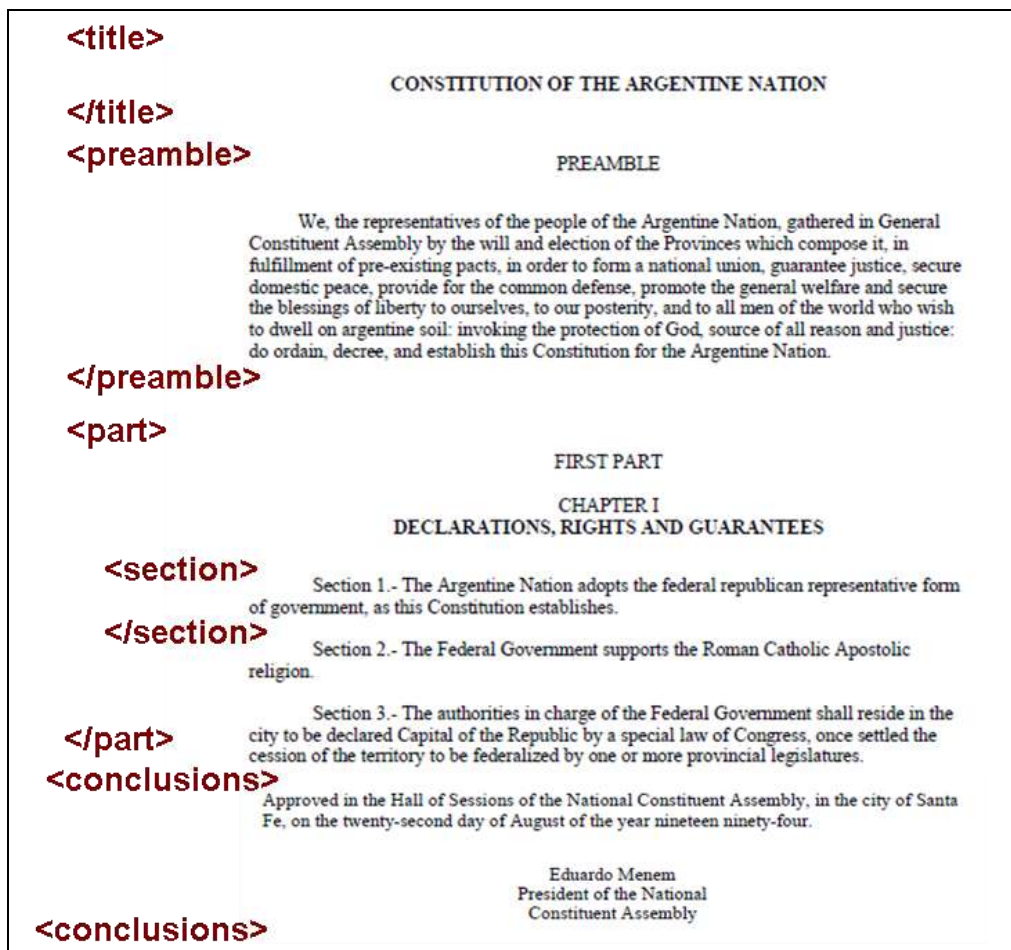


Figure 6 – Example of XML applied to a document.

In a document, XML is used by placing markers (tags) around the various components of the text, such as the title, date of introduction, part, article, conclusion, etc. This requires first the definition of a vocabulary of tags along with rules specifying the meaning of the tags, their format, and how they relate to each other. These rules are defined by special instruments that define templates, of which there are two types: Document Type Definitions (DTDs) and XML schemas. These two techniques can equally be used to both define a glossary of tags, and to set out the grammatical rules with which to use them. A schema acts as a sort of guide to use the vocabulary that a given community shares when checking texts for quality, in order to achieve harmony and interoperability among texts.

Having studied the schema (DTD or XML), the user can apply the tag to the text manually or using specialized editors.

A specialized editor will check the XML file for correctness to make sure that the markers are well formed and that the XML method was properly used. This check is formal and does not also apply to content.

In addition, a specialized editor will also check that the DTD or XML schema was correctly applied. If the user has not marked the text in compliance with the schema, the editor will say that the XML file is invalid and so it cannot usefully be circulated or promote collaboration within a particular community.

### 1.3 *Uses of XML*

What can XML do that other data formats or structures database cannot?

**Machine readable.** First, XML is machine readable: the semantics conveyed by text markers are intelligible to the computer, which can then process the legal information for different purposes in a very rapid manner. In fact, databases would force and delimit the document according to patterns that the programmer decided in advance, and these patterns could not convey the richness of the information contained in the document itself. In addition, XML makes it possible to describe information accurately (down to the single word), giving an expert in the subject complete freedom to decide how to achieve the purpose at hand. Finally, XML cannot alter the document's content, so you know that the document will be legally valid over time.

Many more uses of XML are possible in a parliamentary context:

**Annotation of Bills.** All the bills laid down in parliamentary debates may be connected and it can be accurately determined which parts of the bill originated from a particular member of parliament, thus establishing a connection between the information in the session reports and the final bills. This provides an excellent tool to promote transparency as to what goes on in parliament.

**Better search capability.** Texts may be searched in a very granular way, no longer having to follow a fixed model, as in the previous database method, but using the data contained in the tags and the text together. In addition, several search channels can be combined: structured data, text searches, or searches on tags.

**Multiple platforms.** The same XML document can be used to publish its content across multiple platforms: Internet, mobile, online TV, kiosks, online books, etc. Content can thus be delivered through multiple media without having to modify it.

**Dialogue systems.** Dialogue between different systems and organizations can be enabled through XML language, which is an excellent exchange format. This promotes interoperability among institutions and facilitates the exchange of data.

**Multiple applications.** A document can be opened using different software applications, rather than just one, so there is more freedom to organize parliament, which is no longer tied to any one product. Above all, all of the technologies of the network can be used, as they take XML as a fundamental pillar: blog, wiki, social networking, RSS, etc.

**Reuse of information.** Information is reused for different purposes and at different stages in the legislative process: the agenda of a parliamentary session consists of a list of documents (proposals, written requests to debate bills, etc.) that have been previously deposited and marked up in XML. A lot of information, such as normative references, the proponents, and other important metadata, has already been marked and classified. With XML you can create the session agenda extracting key information from existing documents. The agenda will then be ready to become the stenographic transcript of the session's proceedings, and, finally, the abstract or the draft can be a by-product of the stenographic transcript. As a tree of hierarchically interconnected nuclei (primary, secondary, upstream, and downstream nuclei), XML can be manipulated maintaining the hierarchical relationships, and the information can in turn be easily reused, thus retaining the document's design and structure (Figure 7).



## 1.4 **Legislative XML**

Not all XML standards are suitable to represent legislative or parliamentary documents, and the XML data format, usually available in modern databases, is often confused with a document's XML representation. It is even possible to use an XML standard only to send data between databases having different technological platforms, for example, but in this case the document is fragmented into many XML pieces corresponding to the database structure, and so the integrity of the original document is lost. Considering the institutional role that these documents play, as an expression of a nation's legal culture and of the development of political thought, when a document is so fragmented, we are really corrupting the essence of its content in order to fit it into a computer environment. In turn, legislative XML standards tend to retain the entire legal document's full value, making it possible to exploit the full potential of XML in the effort to improve the legislative process.

When XML is used to represent legal documents—legislative or parliamentary (bills, acts, debates, administrative measures, etc.)—there are some special features of such representation that need to be kept in mind as requisites:

- XML contains information that contributes to the direction of the **workflow**. Thus, each stage of the legislative process can be traced, as it leaves a mark in the XML file with metadata.
- XML Supports national legislative drafting and **best practices**. The technical rule standardizes the way to go about drafting legislation, thus making it possible to check the texts' compliance with the minimum standards included in the XML schemas. We can thus say that XML improves the **quality of law**.
- XML is **interoperable** with other institutions and other resources. The XML format enables every institution to mark up its own documents and to accordingly manage its own parts of the legislative process, while using a common vocabulary of tags and a common language for ascribing meaning to the data. This makes it easier for institutions to exchange data and collaborate in such a way that each institution retains its own autonomy.
- XML is enriched by contributions from citizens. Every citizen can add annotations in the XML file and reuse the XML data, as is happening in the United States with the *Open Gov* and *Open Data* initiatives. This encourages **participation**, and as with other similar tools, such as blogs, wikis, and social networks, XML facilitates cooperation and promotes data reuse.
- XML **preserves** a document's legal validity over a long period of time. As an open data format, XML is technology-independent and so it may be the right format to preserve legal documents over time. Indeed, even only ten years from now we might not be able to read legally valid data stored today. XML solves this problem by allowing us to archive documents and create backup files that continue to be valid indefinitely.
- XML is **accessible** to all through multiple channels. XML allows you to display contents in an accessible way, even for people with disabilities, thus helping to solve the problem of *accessibility* and the *digital divide*.
- XML can be **accessed by anyone for inspection**, while ensuring a balance between privacy and security. Because XML can be understood without additional applications, all citizens can inspect parliamentary documents, without the barrier of any filtering software. XML thus makes it possible for information to be *transparent* and enables citizens to hold government institutions *accountable*.
- **Dissemination and usability**. XML makes it possible to disseminate legal texts without discriminating between the tools used, thus enhancing usability, even by people who do not have sophisticated tools. In short, it does not favor any one technology over the others.
- XML can also be used with **common tools** and document-management systems (*effectiveness*). XML can become a common format to store data in document-management



systems and to create original XML databases that may be distributed and shared among different institutions. By sharing DTD or XML schemas, XML favors the growth of a multilateral community that can agree on how to interact through its data and how to cooperatively develop the various stages of the legislative process (parliament, commission, government agencies, political parties, etc.).

There are also other features—more technical ones—that a Legislative XML standard must have in order to protect the investment made by parliaments over time:

- It is costly and difficult for parliaments to convert their paper documents into XML documents. The chosen XML standard should therefore be designed for full compatibility with other W3C standards, in order to ensure stability and robustness over time, as well as to leverage the tools available in the market. In fact, not all XML standards are compatible with W3C technologies, and this represents a technologic risk that cannot be underestimated: the standard could become technologically outdated in a short time, failing to keep pace with the software designed by developers of information and communication technologies.
- The chosen standard should use abstract models on which to base the creation of all other tags. In technical jargon, a standard so designed is said to be projected onto a “pattern” or template. This means that we first create the fundamental building blocks (like in Lego), and then we combine these to define all other elements that we may need over time, either simple or complex. It thus becomes easier to maintain, expand, and improve the standard over time without losing clarity, simplicity or legibility.
- The standard must be accompanied by a robust naming model for legal resources on the Web, a model that must be expressive, invariant, and persistent over time, so that normative references (or links) to a legal source (a law, bill, conference report, etc.) can itself remain intact in the face of technological developments and any change of servers. For example, when surfing the Internet, we often come upon a Web page that is no longer accessible; this cannot happen with legislative and parliamentary documents. Thus, the classification of legal sources has an immediate effect on the persistence of normative references. The same goes for each name assigned to the marked elements and sources in the XML document (e.g., Art. 13) so that each text fragment can be easily found without having to open the XML document which carries that fragment. If, for example, we want to make Article 13 of Law 15 of 2011 accessible, we will need to place a naming document and an internal-fragments standard next to the XML standard, which makes it easier to create a link with the information that the user has at his or her disposal (e.g., <http://www.parlamento.ar/ley/2011/15/#art-13>).
- The standard should provide a representation of the legislative or parliamentary document, and we must be careful to separate the content produced by the author (parliament, commissions, etc.) from the metadata coming from a government office or from a computer system. Indeed, the document’s content bears the mark of official authorship (it is deemed valid by virtue of its source, namely, its official author), while the metadata (e.g., the classification of search terms) is additional information included by a local publisher (e.g., the library of congress). Another important distinction between content and the ontological level of concepts, places, people, organizations, roles, etc., is that these latter categories may change over time (as when the government implements institutional or other changes), while the XML tagging should, if it is well done, identify a legislative document’s author in an objective and neutral way. All other interpretations of the text should be entrusted to a clearly identifiable and recognizable part of the XML standard. This allows us to keep track over time of those people or organizations that have worked on the document (i.e., on the content created by the author) and how they have enriched it with notes and interpretations.

## 1.5 *The Costs of Legislative XML*

There is currently a skeptical attitude towards the adoption of XML for legal and legislative documents<sup>4</sup>, due to the uncertainty typically associated to the adoption of new technology. In addition, the PDF format has resurfaced as a viable option for managing legislative resources in an easier way.

But relying on the PDF format reduces opportunities to fully implement Web 2.0 tools, and it makes interoperability difficult. Even if the PDF file is enriched with metadata (e.g., GLIN project<sup>5</sup>), there will still be a gap between, on the one hand, the text as introduced and approved by its issuing authority and, on the other, the computer's search-engine output, based on independent metadata and not aligned with the text. In this regard, the ability to provide citizens, third parties, consumer associations, etc., with documents in an open format is undermined, and so is the possibility to contribute to building a knowledge society and to use reasoning tools in the text or semantic ontology to manage texts.

But how much does it cost to markup a whole bulletin in an expressive and semantically rich way with XML? For the moment, to answer this question we must consider several factors:

1. The **type of XML standard**. If the schema is very simple or focuses exclusively on marking up the text structure (header, preamble, motivations, outline, conclusions), the amount of tagging is likely to be small even in comparison with an XML standard that mandatorily tags some legal metadata as well. Thus, on average, the cost of marking up a text will initially depend in part on the chosen standard.
2. The second element to consider is the **stage in the legislative process** when the XML tagging activity comes in. If XML is introduced at a gestational stage (when the document is still a draft), the documents will inevitably take on average more time to be marked up, simply by virtue of the number of changes they go through before they are finally enacted. This problem can be averted by integrating all the phases in the lawmaking process and by getting citizens to democratically take part in the debate at every step of the process. XML makes it easier for citizens to have a role in the lawmaking process, thereby making legislative information clearer and more transparent.
3. The third element that determines the average cost of tagging lies in the **quality of human skills** and in the corresponding training.
4. Finally, the fourth element lies in the **tools used**. There are markup tools that allow simple manual tagging and other editors that use textual analysis to suggest a pre-tagging of the text to users, who can then focus on errors or metadata.

Let us now consider the experience of the Court of Cassation of Italy (which currently has 50,000 active XML documents, marked up using the NormeInRete standard) as a benchmark model and base-line to make an assessment.

### 1.5.1 Tagging Time

The time it takes to apply XML in the Italian Court of Cassation is measured from the moment a legislative document is published in the Official Gazette or from the moment the decision is taken to markup the text in XML once its legislative production is completed. Although this saves many unproductive markup cycles, it also leaves out many of the XML features mentioned earlier.

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<sup>4</sup> See the World e-Parliament 2010. *Global Center for ICT in Parliaments*, United Nations, Department of Economic and Social Affairs (UNDESA).

<sup>5</sup> GLIN – Global Legal Information Network <http://www.glin.gov/search.action>

### Markup time

	Manual markup	Semi-automatic markup
Average time for marking up a 20-page document limited only to the structure (sections, header, annexes, conclusions)	60 minutes	30 minutes
Average time for marking a document with 10 normative references	60 minutes	15 minutes
Time for specialized legal metadata (e.g., rating of references, rules, etc.) pertaining to 10 references	30 minutes	15 minutes
Consolidation time	30 minutes	15 minutes
Average time per document	2 hours	1 hour and 15 minutes
* The hourly rate depends on the country and on labor costs	~\$25	~\$15

### Initial formation cost

	Manual markup	Semi-automatic markup <sup>6</sup>
Time needed to form structure	5 days	3 days
Time needed to form normative references	3 days	1 day
Time needed to form metadata	2 days	3 days
Time needed to consolidate	5 days	3 days
	15 days	10 days
* the hourly cost depend by each country	~\$10,000	~\$7,000

## 1.5.2 Software Costs

Finally, we must also consider the cost needed to acquire and set up the software, which in any event is increasingly becoming available as open-source software (Bungeni, Norma-Editor, etc.). The cost will thus depend on the work needed to customize, support, and maintain the markup editor in such a way as to increase automatic recognition as much as possible and minimize markup time (\$5,000–\$30,000, depending on the complexity of automation required, and on the degree to which the software will need to be integrated with the local workflow or with previous information systems).

Thus, if a country produces an average of 9,000 new laws a year (i.e., about 20,000 hours of markup time), the higher cost will be attributable to the staff required for such markup (a team of 15 people).

## 2. Advantages of using Legislative XML

The purpose of this analysis is to assess what is the best way of representing each document in the legislative process using a Legislative XML standard suitable to represent parliamentary documents. These Legislative XML benefits depend on two components: (i) the type of markup standard chosen, since not all Legislative XML standards are designed for rich and expressive

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<sup>6</sup> Semi-automatic markup requires that the IT department be involved in personalizing and customizing the software on the basis of the type of documents and the language used.

markup; and (ii) the use made by parliament, or whether parliament uses XML for its full lawmaking cycle or only for Web publishing.

## **2.1 Benefits for Parliamentary Work**

### **2.1.1 Accessibility**

Documents created using Legislative XML from the outset, easily lend themselves to being processed for publication online, in such a way that they can be accessed in an open format and reused by other actors throughout the chain of legal documentation. The entire legislative process can effectively be tracked in its evolution over time, also taking into account the various versions of the proposal or bill, its amendments, and the various versions prepared by committees.

### **2.1.2 Transparency**

Documents can connect with one another in chronological order to yield an overall view of every stage the record goes through. This functionality will depend on the XML markup standard used, as well as on the policies and strategies adopted by parliament.

### **2.1.3 Simplification**

The documents created using Legislative XML are workable and can therefore simplify repetitive passages, as is the case when applying amendments or headers; reusing text fragments; and identifying, viewing, and comparing different versions of a bill at different stages of its development.

### **2.1.4 Independence from Proprietary Platforms**

Using an XML standard for archiving documents means we do not have to rely on proprietary formats, and that we accordingly do not have to depend on any given software application.

### **2.1.5 Multi-channel Publication**

The availability of an XML standard to represent documents makes it possible to distribute contents in various formats (i.e. HTML, PDF, etc.) and through multiple channels (i.e. the Web, TV, phone, etc.).

### **2.1.6 Reuse**

In some European countries, legal files marked in XML become a source that can be reused in new and more specialized publishing formats, enriched by authorized comments or legal advice. This leads to the creation of new markets based on the reuse of XML legislative data provided by parliament or other government institution. New services aimed at professionals are developed and the government can obtain funds to support free online access to norms. This is the case with the French government portal Legifrance, which has provided a series of special agreements with law publishers to provide them with all the rules of law marked in XML. With the income from these types of agreements with the private sector, Legifrance has enhanced public-service delivery of legal texts online.<sup>7</sup>

### **2.1.7 Interoperability**

Several actors are involved in the lawmaking process, and interoperability is important in making it possible for the entire workflow to proceed without wasting time or work. Having a standard that can be shared among a lower house, a senate, and other government institutions makes it possible to

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<sup>7</sup> On the Web at [http://www.legifrance.gouv.fr/html/licences/licences\\_contrat.htm](http://www.legifrance.gouv.fr/html/licences/licences_contrat.htm).

efficiently exchange documents without unnecessary duplication of work, as when correcting drafts, comparing different versions of a bill, or passing the complete record from one chamber to the other.

### **2.1.8 Comparative Analysis of Legislation**

With a minimum set of common data from the descriptive Legislative XML standard, legal structures can be harmonized (e.g., an article is a common concept in all laws, as is a statement of reasons). This facilitates the comparative analysis of legislation relative to a particular geographic area (e.g., Central America or East Africa) and helps towards upholding the principles that connect all mutually influencing legal sources from various countries in the same geopolitical area.

## **2.2 Benefits of Applying XML**

### **2.2.1 Texts are constantly updated**

XML can be used, at any given moment in time, to semi-automatically update texts, in a mode called multi-validity. This mode makes it possible to access the latest version of a document, as well as the entire chain of versions produced over time, such as the different versions produced by the committees or through the exchange of documents between the two chambers of parliament.

### **2.2.2 Simulating Regulation and Quality Control**

XML documents make it possible to simulate a regulatory framework when considering the introduction of amendments or new norms. This allows parliament to assess the impact of changing a regulation *ex-ante*, correct normative references, and ultimately improve the quality of legislation. Moreover, the XML document is not intended as a single piece of legislation but as a component of a more complex web of relationships within a broader body of law: the idea is to have a digital regulatory system, and not just digital legal information.

### **2.2.3 Semantic Searching**

XML documents allow indexing and processing through search (query) filters that work directly on the text annotations and the metadata of the represented document by taking advantage of the Semantic Web techniques (classification, Linked Data, etc.).

### **2.2.4 Long-Term Conservation**

Dematerialized legal documents modeled and represented in XML preserve their legal validity over time, maintaining a clear separation between original content (as formalized in the enactment stage) and the reworking that the text goes through during the reporting process. This allows us to include a digital signature in the XML document, thus freezing authenticated documents, even digital ones, so that it may be represented in the future without the intrusion of subsequent modifications.

### **2.2.5 Self-Containment of Knowledge**

A good Legislative XML schema must represent the knowledge encapsulated in the document without fragmenting it in the logical schema of a database or when processing the document through an application. This preserves neutrality with respect to applications, platforms, and technological developments and keeps the ability to represent the legal knowledge contained in the document intact, in such a way that the document can move freely throughout the network.

## **3. Challenges Involved in Using XML in the Legislative Process**

As much as using XML has some undeniable advantages, its use in the legislative process poses challenges that should be assessed. There are *(i)* political challenges, *(ii)* management and organizational challenges, and *(iii)* technological challenges.

## **3.1 *Political Challenges***

### **3.1.1 Political commitment**

All technology projects of wide scope that involve complex structures, such as parliaments, require a strong political commitment. These projects not only bring changes that affect the management structure, but also require adherence to specific government policies.

### **3.1.2 Interoperability with other agencies**

Reorganization projects that seek to further the flow of documents usually involve a full array of institutions, agencies, officers, directors, and departments. Even though their respective work can be made considerably more effective by virtue of their greater ability to engage with one another, it is necessary to intervene on a political level.

### **3.1.3 Long-term economic hedge**

It should be noted that such projects usually have a high initial cost and do not begin to show their benefits before three to five years into the project. This is typically longer than the political cycle will last. It is therefore necessary to have a solid, long-term commitment to ensure the investment will continue and to monitor progress and performance without political interference.

### **3.1.4 Legislative drafting guidelines**

If we are to successfully implement a wide spread use of XML in legal documents, therefore maximizing the technology's potential, we will need to make sure that parliamentary documents are properly worded according to an agreed standard. Such properly worded documents exhibit a regularity that helps us in correctly and efficiently implementing a standard, in developing best practices for legislative quality, and in developing software-supported processes. Legislative-drafting guidelines are a technical tool, but their adoption in Parliament's day-to-day work depends on a political decision.

## **3.2 *Organization and Management Challenges***

### **3.2.1 Involving End Users**

By and large, the success of such projects depends on the ability to involve end users (personnel) from the early stages of the project. Involvement should not be limited to collecting useful suggestions for applications to be more functional; it also means encouraging users and creating a community of working groups and a support network for the development of best practices.

### **3.2.2 Reorganizing Offices**

No innovation can take place without reorganizing offices and redesigning work around the potentialities offered by the new technology. Digitally reproducing what happens on paper is the biggest mistake a government administration can make; it is necessary to think of a new way of organizing work, and that is in part why we need to involve working groups comprised of end users.

### **3.2.3 Personnel Training and Assistance**

The main reason why end users may resist the introduction of new technologies at work is a lack of adequate skills. It is thus necessary to set up a good training program, providing end users with the needed skills, while at the same time explaining to them the benefits brought about by the new technologies.

### **3.2.4 Project Management**

Experts are needed who have experience in this kind of transition from traditional databases to XML document collections. An interdisciplinary culture is a must, which should take into account the legal and organizational aspects (management and planning), as well as monitoring and evaluation processes. The project leader should have enough authority to make important decisions in agreement with the policy-makers in power.

## **3.3 Technological Challenges**

### **3.3.1 Proprietary XML Standards**

Choosing a proprietary XML standard represents a particular risk, that is, using a standard developed with software applications owned by a private firm under a trademark or patent. XML is an open technology that defines a language to describe other, more specific languages through XML or DTD schemas. XML standards are therefore defined by schemas which consist of objects that use XML syntax but are deemed independent intellectual work. It is like saying, by analogy, that Spanish is an open language and Gabriel García Márquez's *One Hundred Years of Solitude* (which uses that language) has its own copyright. And so it goes with XML standards. There are XML standards that are born as open-source and others that companies design without releasing the schemas, thereby retaining the technology and undercutting the possibilities for interoperability.

Another limitation in the use of XML is that, although XML is an open standard, it is often used as a data format, and that means that the document will not be autonomous. In these cases, XML becomes only a formality between proprietary applications and a means by which to circumvent complex data structures (such as databases), but its use depends on those applications.

### **3.3.2 Maintaining the Standard over Time**

The start-up cost of creating a standard is low, and the initial setup is quick. But what makes a standard successful is the ability to share it across the world among various key actors, and even more important is the standard's ability to fit the government model that supports it. This means that when we choose a standard we have to consider the government model that keeps it alive over time, taking into account such questions as how decisions are made when it comes to extending the standard, who updates it, who produces documentation, who provides customer support, and who can provide adequate training. A robust and scalable technical architecture for the standard provides a solid foundation for an open community to intervene without making the standard less amenable to customization. Maintenance becomes easier when the standard is based on patterns.

### **3.3.3 Converting Existing Databases**

Converting computer systems to the new XML standard will require a feasibility assessment that is attentive not only to the technological aspects but also to economic and organizational ones. Undoubtedly, it will be necessary to align the databases and the existing documentation systems to the new standard. Planning when and how to move from a traditional system to a system based on XML is an important decision that has many implications. You can make different systems coexist for a certain period or move to XML only after a certain date. Hybrid solutions are also possible, but they limit the extent to which you can realize the potential of XML.

### **3.3.4 Markup Time**

The greater informational expressiveness of XML has a cost. It often takes interpretation to semantically and descriptively mark up a legal document, and that entails essential intellectual work. If the XML schema is intended to also capture the semantics of the legal document, then the effort increases. It is necessary to correctly evaluate the scalability of the standard adopted so that you can gradually decide how deep to go in doing the markup. At the same time, if the standard has

a robust and well-designed structure, it will be possible to mark up at different levels without compromising an advanced markup phase.

### **3.3.5 The Choice of Tools**

Tools are essential in speeding up markup activity in routine parts of the text so as to focus on those parts that require intellectual work. You can choose tools that analyze the text and automatically extract metadata based on regularities in the structure, language, and the position of the metadata. These tools—often custom editors—preview the result of users' work and request confirmation. They also provide tools with which to manually fix the computer's processing and to mark up the parts of the text that have been wrongly captured or not captured at all. Archive tools can suggest the appropriate operations to be carried out in the workflow process, and can semi-automatically update the user's modifications.



## PART II

### How to Use Legislative XML

#### 4. State of the Art in Legislative XML

There are many XML standards applied in law, but few meet the previously mentioned characteristics. Many have been created only for Web publishing and make no distinction between representation and presentation of content (Formex is one example). Others (such as LexDania and NormeInRete) are specific to a country and are difficult to adapt to other legal systems. Still others (the US House of Representatives XML standard) do not distinguish the applicative-procedural part from the mere representation of the document.

The only Legislative XML that in the current state of the art meets all the characteristics listed above is Akoma Ntoso (<http://www.akomantoso.org/>), established in 2004 and funded by UN/DESA as part of the project “Africa i-Parliaments Action Plan: Strengthening the Role of African Parliaments in Fostering Democracy and Good Governance through Knowledge and Information Management.”<sup>8</sup> A customized version of that standard, LexML Brazil, is currently in use by the Brazilian Senate (<http://projeto.lexml.gov.br/esquemas/xml.xsd/view>). Additionally, Chile has adopted at its Library of Congress an XML standard similar in some respects to Akoma Ntoso, but it models the normative document in its final phase (enactment) without taking into account the entire legislative procedure. A schema limited to the function of exchanging documents is offered at <http://www.leychile.cl/esquemas>. Foregoing implementations offer different tools based on this schema (see [http://www.leychile.cl/Consulta/legislacion\\_abierta](http://www.leychile.cl/Consulta/legislacion_abierta)).

Akoma Ntoso has the virtue of providing within a single schema the full set of tools needed to model all parliamentary documents. For example, some extensions are necessary to customize Akoma Ntoso to the specific document types and formal characteristics of Uruguay’s Parliament and its legislative procedure. However, as the Brazilian implementation shows, this is not a limitation but a sign of flexibility.

We have seen plenty of Legal XML standards crop up over the last ten years for describing documents as legal resources. Before introducing the basic elements of Akoma Ntoso we want to classify such existing standards—the current state of the art—on the basis of their main characteristics, especially with regard to the multi-layer subdivision previously presented. Four classes can be identified as follows:

- The *first-generation* legal-document XML standard<sup>9</sup> was mainly aimed at describing the legal text and its structure with an approach close to the database model or the typography-based word-processing models.
- The *second generation*<sup>10</sup> paid more attention to modeling and describing texts, their structure, and metadata. Still, the elements were being described without a prior abstract analysis of the data classes, and the result was a long list of tags, with complex inclusions of DTDs or XML schemas and much overlapping between metadata and text definition, along with weak instruments for linking text to other layers.

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<sup>8</sup> On the Web at <http://www.parliaments.info/> “Africa i-Parliaments Action Plan: Strengthening the Role of African Parliaments in Fostering Democracy and Good Governance through Knowledge and Information Management”.

<sup>9</sup> Such as EnAct or Formex.

<sup>10</sup> Such as NiR or LexDania.

- The *third generation*<sup>11</sup> is based on patterns. Patterns define the properties of a class and its grammar—providing a content model and specifying the class’s behaviour and hierarchy in comparison to other classes—in such a way that any additional tag will belong to an existing abstract class, which allows consistency to be preserved over time. A basic principle is that we must be very careful to divide the text, its structure, its metadata, and the ontology, in order to be able to reliably track any new layer placed on top of the bare text. A pattern ensures clarity of design by defining general rules that no longer impose real constraints in markup, but on the downside, this means that the standard lacks *prescriptive* constraints.
- The *fourth generation* (examples are RELEX NG, Schematron, and DSD) uses the pattern jointly with co-constraint grammars to resolve the aforementioned problem of lack of prescriptiveness.

Akoma Ntoso belongs to the third generation and is in the process of becoming a fourth generation Legal XML standard. For this reason we take it as a success case example for introducing the Legislative XML markup.

## 5. Managing Legislative Documents

### 5.1 Modeling the document

One of the pillars of Akoma Ntoso, and of the other (pattern-based) standards of the same generation, consists in preserving to the extent possible the ontological values of the legal document. Akoma Ntoso, in other words, ensures that the legal document will be preserved exactly as the author has represented, modeled, and conceived it, independently of the XML technique used. This explains why XML is used by Akoma Ntoso on a document-oriented approach rather than on a data-oriented one. The tags are entered in the document in order to model its semantics rather than to break up the document into several database fields. The diagram below shows the challenges associated to such fragmentation, which is also dependent on the applicative layer.

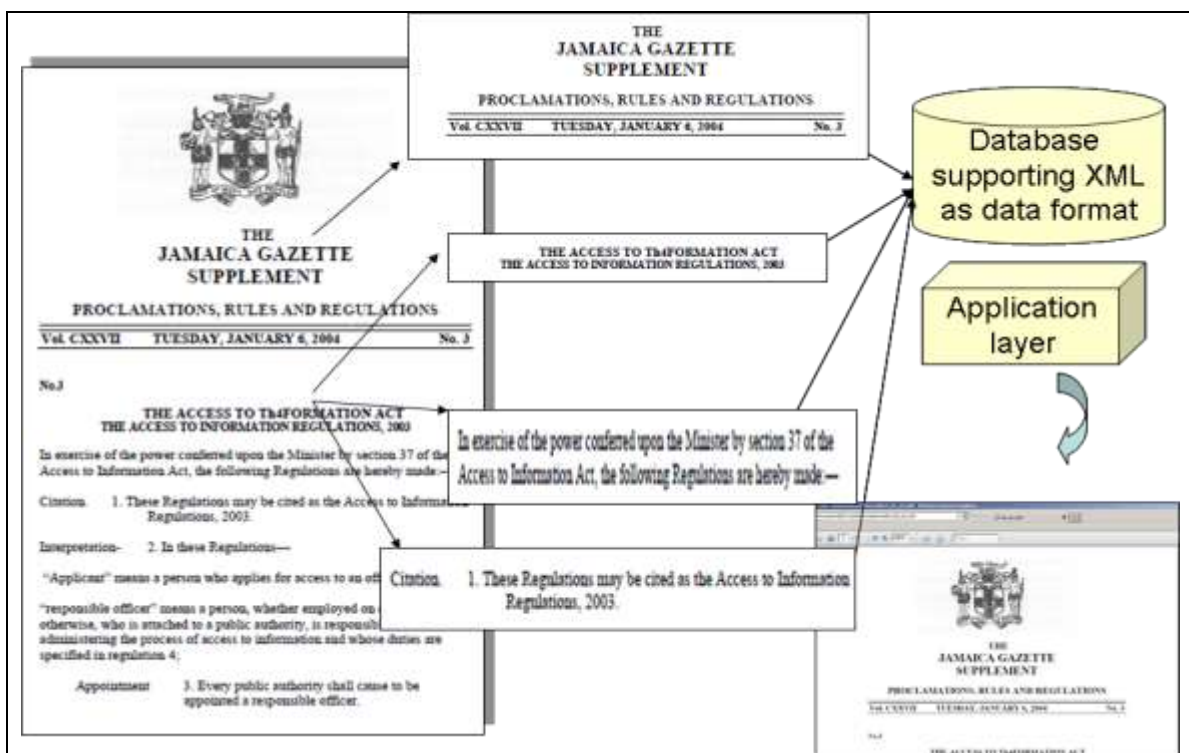


Figure 9 – Fragmentation of a legal document.

<sup>11</sup> Such as CEN/Metalex and Akoma Ntoso.

The document-oriented approach makes it possible to preserve the document as the author created it: the logic of the database does not alter the content or the order of the elements; the document is thus application-independent, ensuring more transparency and persistency over time.

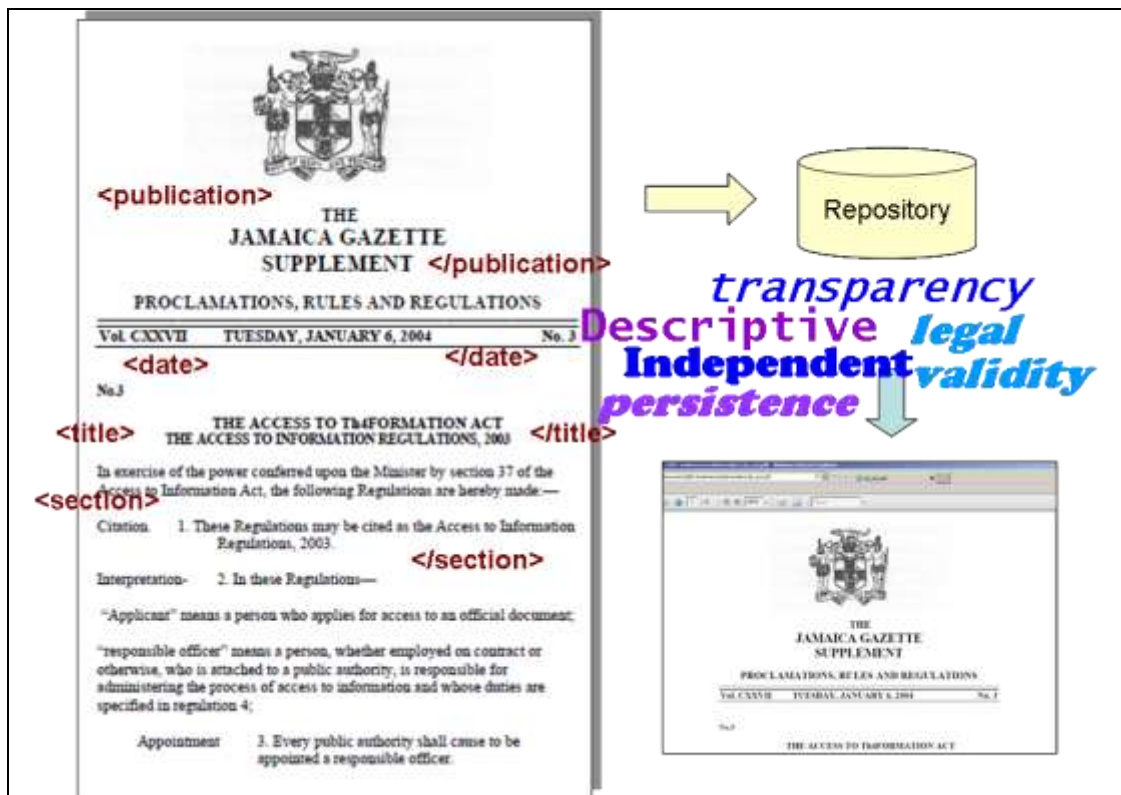


Figure 10 – Document-oriented approach.

If the document contains several annexes or a particular structure, Akoma Ntoso will not force it into the standard but makes it flexible, so as to represent the author’s intentions. This is essential in making sure that the document’s contents preserve their legal validity over time, accurately reflecting what the competent issuing body originally intended with respect to such contents. For this reason, the roles the different actors play in the document-management process are kept clearly distinct, as is the metadata coming from workflow processes.

## 5.2 ***Descriptive and Prescriptive***

Another pillar of Akoma Ntoso is that it is both descriptive and prescriptive. By descriptive we mean a standard that accurately describes with tags the document’s various organizational functions (articles, chapters, sections, headers, etc.), allowing an expert to read the document under the guidance of the vocabulary used to enclose the text into sections.

A standard is descriptive when it uses a vocabulary of tags representing the domain where it should be applied. The tags are selected by domain experts, not by computer technicians, so that the tags enable the markup to convey the true semantic meaning contained in them.

A standard is prescriptive when it defines the tags’ coercive behavioral rules, thus determining not only the vocabulary but also how it should be applied. In legal drafting we usually deal with defined codes of rules that define behaviors and conventions for the correct formation of laws: in a prescriptive XML standard, these rules can be translated into technical delimitations included in the standard itself to facilitate compliance with the rules of legal drafting. For example, an XML document consisting of articles could be set-up in such a way that articles will always have a unique number, for example, paragraphs are sequentially numbered and the structure is hierarchical. Otherwise, the XML document will not be standard-compliant; hence it will not be valid.

This process allows for a example, for a legislative official to open the XML document marked in Akoma Ntoso and without knowing anything about XML guess the function of each of the document's parts referenced by tag names that matter to the expert and not to the computer technician. Other standards have instead chosen to use a terminology and a technical vocabulary for which the item is no longer enclosed within tags (as in <article>) but within more-neutral terms, such as <paragraph> or <block>.

Secondly, Akoma Ntoso uses its own schema to provide a set of rules for sound regulation requiring a minimum set of quality links (e.g., the numbering of the articles). Thanks to this feature, tools can verify the correct composition of a legislative text.

### 5.3 GLIN and Legislative XML

A possible evolution of GLIN, as tried out in the United Kingdom, is to circulate the metadata in XML. With an Akoma Ntoso format you can populate your own internal database and supply the necessary metadata for the GLIN network as an extraction of the XML document.

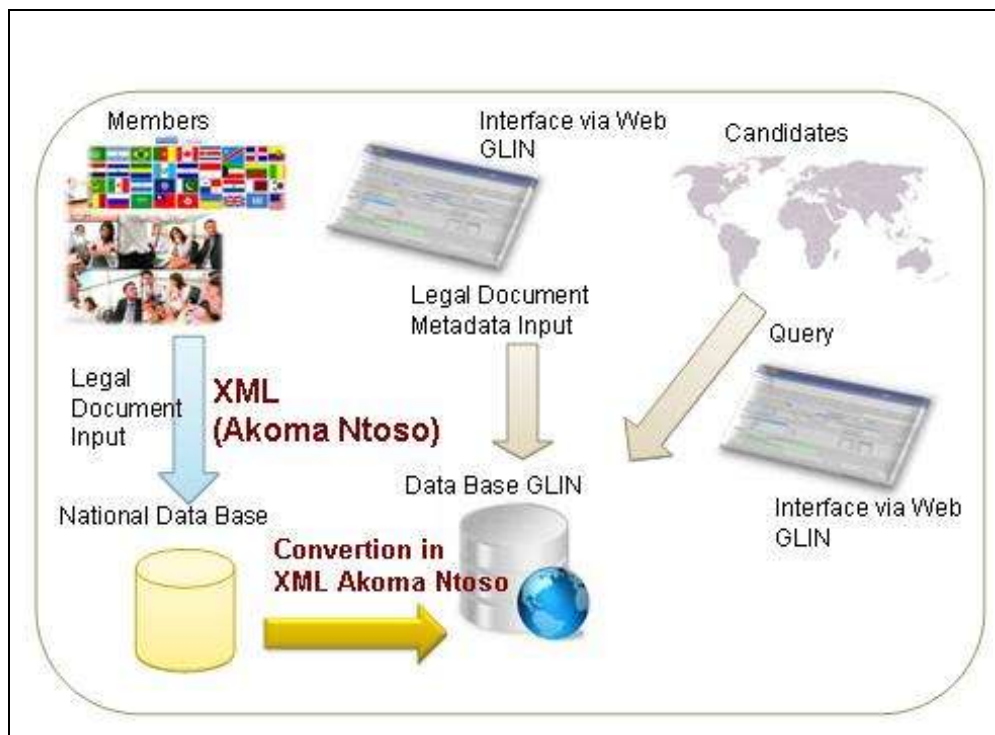


Figure 11 – Integration landscape between GLIN and Legislative XML.

## 6. Legal Document Value over Time

The Akoma Ntoso Legal XML standard is designed to enable all the aforementioned characteristics, and that gives us an advantage in working toward the goal of long-term preservation. Still, we now want to analyze how an XML file could acquire legally binding proprieties, and how these properties can be maintained as a stable requirement to preserve authenticity, integrity, and validity over time in the face of technological change. To this end we must first make sure that the properties we refer to are given new definitions on a legal-informatics approach. There are four definitions in particular:

**AUTHENTICITY**, which in this context consists of having certain elements to declare that the document is endorsed by a competent body, through an official chain of power and roles, and that the content is compliant with the document's original version, which is the version that the authors decided to issue acting through their sovereign powers.

**INTEGRITY** consists of being able to detect any changes that may have intervened between the document's single digital items (physical copies) and the original master file. Also, any graphical transformation could modify the way we perceive a document's normative and legal content, and so integrity is not confined to guaranteeing the correctness of the hash-algorithm control but is also meant to preserve the layout form, which is also an instrument to communicate the law's correct interpretation.<sup>12</sup>

**VALIDITY** is achieved once all the normative rules are applied (including the signature) with which to produce an enforceable and legally binding document.

**PERSISTENCY** consists of storing the document over the long period, and archiving all of the connected information concerning the XML standard's entire logical schema, along with the history of the document and how it is produced (e.g., hardware, software, etc.), the different layers of annotations, and the various persons in charge of markup. In other words, persistency consists of having information with which to trace the document's entire lifecycle.

### 6.1 *Authenticity, Integrity, Validity, and Persistency*

In several European countries, the increasing use of Legal XML has made it easier to release a legally valid online official gazette using different security systems for guaranteeing authenticity, validity, and integrity (chain of confidence, digital/electronic signatures,<sup>13</sup> and workflow certification). In Estonia since 2001, in France since 2004, in Slovenia since 2007, and in Italy since 2009, the paper and electronic version are equally valid; in Norway since 2001, in Austria since 2004, in Denmark since 2008, and in Spain since 2009 only the electronic version is deemed the authentic format. The use of digital/electronic signature techniques coupled with a tight control of the entire publication process guarantees the electronic document's authenticity and integrity, and consequently the validity of the online official gazette (either on a document-by-document basis or with reference to each issue of the gazette as a whole).

Most applications start the process of electronic publication from an XML format document; then they transform the XML into some invariable form (e.g., PDF/A) so as to present the outcome to the end user in a friendly and readable manifestation, likewise ready for Web presentation. The problem that we have in most of these applications is how to balance three main aspects: (i) preserving as much as possible the separation between the legal document's content as produced by the original author from the metadata added in the post-processing workflow; (ii) preserving the document format's semantic descriptiveness (ideally in XML); (iii) maintaining the document manifestation's legal validity (the manifestation as expressed in a particular graphical layout, and the document as signed by the issuing authority).

We want to analyze three main scenarios in the current state of the art. Our model is based on two premises: (1) an original legal document format should be fixed as a master copy for legal reasons (i.e., so as to clearly identify the original source of law) and also for legal-archiving purposes; (2) the authority authorized to endorse the law signs the digital document in a well-know and mandatory fixed format<sup>14</sup> that should be identical to the end-user presentation, without any intervening manipulation by external applications.

In these circumstances we have three main possibilities:

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<sup>12</sup> Just providing a graphical layout and paragraph marking can alter the legal message the author intends to communicate, as can the simple act of rearranging the annexes' hierarchical organization (e.g., the hierarchy of the laws).

<sup>13</sup> Directive 1999/93/EC of the European Parliament and of the Council of 13 December 1999 on a Community Framework for Electronic Signatures.

<sup>14</sup> Annex III, paragraph 2, Directive 1999/93/EC: "Secure signature-creation devices must not alter the data to be signed or prevent such data from being presented to the signatory prior to the signature process."

**THE ORIGINAL LAW IS THE XML** file and the authority (e.g., president, queen, ministry) signs the XML file directly (using a digital signature). In this case the XML is the source of law, and any transformation could in principle alter the original document (the XML). The XSLT could delete, integrate, and move parts of the content that the author (e.g., parliament) has fixed using its legislative power and sovereignty. If the PDF is discrepant from the HTML version derived from the XML file, the only legally valid and binding document for the judge is the act's XML form. The advantage of this approach is that of preserving the semantic representation embedded in the XML file that has legal validity. This is the approach that Austria has chosen. Its disadvantages lie in the fact that the digital-signature process fixes only the XML file and not all the other instruments (e.g., XSTL, XSLT-FO) involved in the graphical transformation. So, in the future, the XML file might be transformed into different readable layouts without any integrity check with respect to the original version signed by the competent body. Second, in line with normative theory of law, the tags added while marking up the file or included through the transmission protocol will themselves become sources of law because approved by the authority with an authentication process and signature. So much is this second consideration a matter of fact that in this scenario the metadata embedded in the act's XML representation are themselves assumed to be integral elements forming the source of law, even if the markup process by its nature makes it necessary to interpret the normative content being marked up. Moreover, the metadata (e.g., classification, keywords, qualification of normative references) unquestionably amounts to subjective interpretation (data about data) and usually is officially and intentionally approved by the author or authority (e.g., parliament). The risk in the future is that of opening an XML file containing mixed information: content approved by parliament, metadata included by the marker, other tag elements added by the computer systems—in such a way that it becomes impossible for us to distinguish the original content from the added technicality. It is questionable if in this scenario we can maintain the persistency and integrity of the original endorsed content as approved by its author over the long run (e.g., one hundred years).

**THE ORIGINAL LAW IS THE TRANSFORMATION** in some unmodified and static format (e.g., PDF/A) of the XML file. The authority signs this transformation, and the XML is no longer legally valid. Consequently, any other transformation or elaboration of this XML file will not thereafter be legally valid. The disadvantage is evident. We would miss the opportunity to use XML documents with legal validity and interoperability, and we would face much greater semantic Web challenges.

**THE AUTHORIZED PERSON SIGNS BOTH FORMATS**, the XML and the PDF. In this case we have a double original source of law, possibly with a slight discrepancy in layout and with a noteworthy problem in regards to the primacy and certainty of law.

A possible robust solution is to sign the XML file and the XSLT specifications that can reproduce the transformation as well as the authority or the person authorized to see when he or she signed the digital document. This procedure would allow for the XML file to be used as a legally valid source of law for any legal purposes and also for long-term archiving. Moreover, the XSLT and CSS *digests* (the result of the hash function's transformation) could be included in the XML for an integrity check (`href="SHA1=77394DA98349F[...]"`). In some normative frameworks, as in Italy, using this approach would mean that any other transformation (for example, as into a PDF format) can be considered a conforming copy of the original digital document (e.g., the transformed XML) if the authorized person signs the conformity statement/certificate. If we go with this solution we will in the end have these results: (i) the original legally binding document is in an XML format using a Legal XML standard that clearly separates content and metadata, using a robust document ontology; (ii) the signature is applied simultaneously to both the XSLT and the CSS that takes up the layout transformation; (iii) the signature also involves the DTD or the XML-schema; (iv) the XSLT and CSS package hash is included in the XML file metadata to guarantee self-contained integrity of both the document's content and its visual transformation.

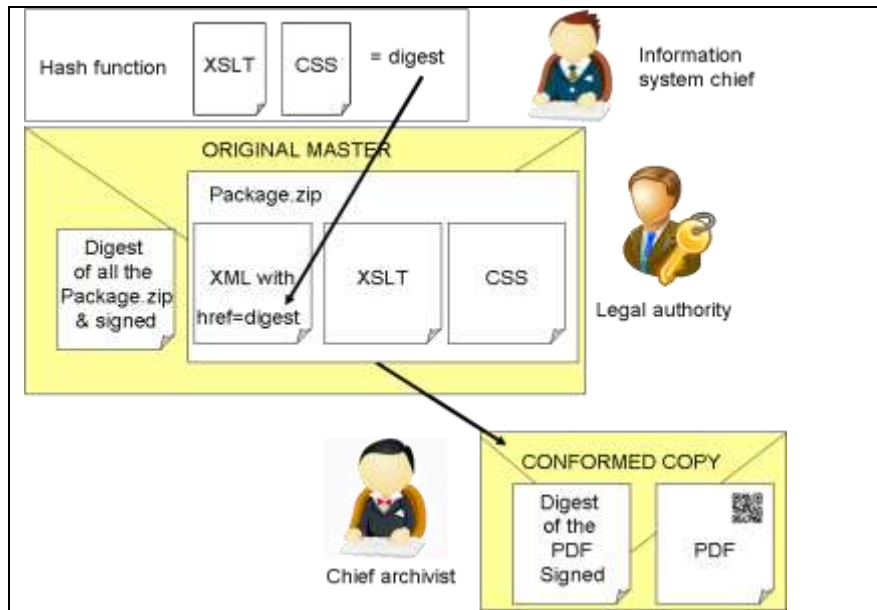


Figure 12 – Digital signature of an original legal document.

A possible further transformation into PDF from the original XML file is possible as a conforming copy if the person responsible for the legal archiving (e.g., the head of the official gazette) signs the conformity statement. Recently, the Italian Law on the Code of the Digital Government Administration (*Decreto Legislativo* 82/2005) was amended<sup>15</sup>, making it possible to use a two-dimensional digital stamp applied to the document, even in the analogical format, so as to make it easier to check for conformity between the PDF file content and the original XML file embedded in the digital stamp.<sup>16</sup>

## 6.2 Legal Validity with Digital Signature

The digital signature is the technique officially endorsed by several countries to ensure the legal validity of legal documents<sup>17</sup>. The digital signature also guarantees three important technical characteristics: author's authentication, integrity of the signed document, and non-repudiation of the document's origin. These technical characteristics are the fundamental pillars on the basis of which to recognize the legal effectiveness of digitally signed documents (e.g., enforceability of a contract), to determine whether the legal subscription requirements for the handwritten signature are satisfied, and to declare the document admissible as evidence in a court of law.

The European Telecommunications Standards Institute (ETSI) and other standardization bodies recommend the use of XAdES (XML Advanced Electronic Signatures), a cryptographically sound format, for managing advanced digital signature envelopes. The extensible nature of Akoma Ntoso allows XAdES signatures to be used in conjunction with Akoma Ntoso documents.

<sup>15</sup> Decreto Legislativo No. 235 of 30/12/2010, modifying Decreto Legislativo No. 8 of 27 March 2005, containing the *Codice dell'amministrazione digitale*, pursuant to Art. 33 of Law no. 69 of 18 June 2009 (GU n. 6 del 10-1-2011 - Suppl. Ordinario no. 8).

<sup>16</sup> That is the case with the Italian *Official Gazette* process and with some applications in the Italian Ministry of Finance.

<sup>17</sup> Law of the People's Republic of China on Electronic Signature, effective from April 1, 2005; Electronic Signature Directive (1999/93/EC), for all European member countries; Electronic Signatures in Global and National Commerce Act, enacted June 30, 2000, in the United States under the Uniform Electronic Transactions Act, adopted by 48 states; Secure Electronic Signature Regulations, in force since February 1, 2005, in Canada; Decreto Legislativo no. 82 of 7/3/2005, the code for the digital administration.

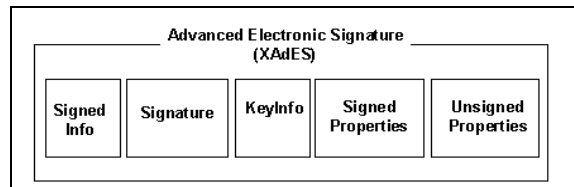


Figure 13 – Advanced Electronic Signature XAdES Architecture<sup>18</sup>.

For example, one could include in an Akoma Ntoso document hashes of the XSLT and CSS files used to display the XML file to the user. These hashes could be further annotated as XAdES SignedDataObjectProperties.

```
<xsd:element name="SignedDataObjectProperties"
  type="SignedDataObjectPropertiesType"/>

<xsd:complexType name="SignedDataObjectPropertiesType">
  <xsd:sequence>
    <xsd:element name="DataObjectFormat" type="DataObjectFormatType"
      minOccurs="0" maxOccurs="unbounded"/>
    <xsd:element name="CommitmentTypeIndication"
      type="CommitmentTypeIndicationType" minOccurs="0"
      maxOccurs="unbounded"/>
    <xsd:element name="AllDataObjectsTimeStamp" type="TimeStampType"
      minOccurs="0" maxOccurs="unbounded"/>
    <xsd:element name="IndividualDataObjectsTimeStamp" type="TimeStampType"
      minOccurs="0" maxOccurs="unbounded"/>
  </xsd:sequence>
</xsd:complexType>
```

Figure 14 – SignedDataObjectProperties<sup>19</sup>.

The use of the XAdES-T variant also provides guarantees with respect to variants, to the accuracy of the time-stamping metadata and provides information to fix the exact time of the signature, a detail used in some legal and legislative documents to determine the first event that makes a document effective (i.e., valid and capable of producing legal effects).

## 7. Akoma Ntoso

Akoma Ntoso<sup>20</sup> is a set of simple, technology-neutral XML machine-readable descriptions of parliamentary, legislative, and judiciary documents, such as legislation, debate records, minutes, and judgments, that enables addition of a descriptive structure (or markup) to the content of parliamentary and legislative documents. The AKOMA NTOSO XML schema makes the structural and semantic components of digital legislative documents fully accessible to machine-driven processes, thereby supporting the creation of high-value legislative-information services; thus greatly improving efficiency and accountability in parliamentary, legislative, and judicial contexts.

In addition, it also makes it possible to build software applications with which to manipulate the structure and semantic context of legal documents rather than simply manipulating them as plain undifferentiated text. Such contextual access to legislative information makes it easier to use ICTs in helping institutions and citizens to become more involved in the lawmaking process.

<sup>18</sup> Page 11 from ETSI TS 101 903 V1.1.1 (2002-02) [http://uri.etsi.org/01903/v1.1.1/ts\\_101903v010101p.pdf](http://uri.etsi.org/01903/v1.1.1/ts_101903v010101p.pdf).

<sup>19</sup> Page 25 from ETSI TS 101 903 V1.1.1 (2002-02) [http://uri.etsi.org/01903/v1.1.1/ts\\_101903v010101p.pdf](http://uri.etsi.org/01903/v1.1.1/ts_101903v010101p.pdf).

<sup>20</sup> The term *Akoma Ntoso*, meaning “linked hearts” in the language of the Akan people of West Africa, signifies understanding and agreement. Similarly, the Akoma Ntoso standard represents common XML standards providing open access to parliamentary documentation and enabling parliaments to exchange information more efficiently, like “linked hearts.”



Akoma Ntoso was developed in the context of a project sponsored by the United Nations Department for Economic and Social Affairs (UN/DESA) to support open access in African Parliaments, and its maintenance is currently supported by the UN/DESA Africa i-Parliaments Action Plan. The standard is now being adopted or is becoming a good practice in a number of government bodies in other countries (e.g., the Brazilian Senate and the European Parliament) that aim to customize and adapt Akoma Ntoso to their legal systems and purposes.

Currently, a modularization of the full Akoma Ntoso language aimed at extracting sub-schemas focused on specific types of documents is being developed. A tool developed by the Department of Computer Science of the University of Bologna (<http://akn.web.cs.unibo.it/aknssg/aknssg.html>) provides a mechanism to produce on the spot the sub-schema the user is interested in.

## 7.1 **Definition of a Legal Document**

A legal document can be considered in this context as any text which contains data or information presented in a more or less structured way, and which (i) represents or gives evidence of a legally valid event (a debate or committee meeting), (ii) sets out a statutory rule, (iii) grants a right, (iv) records a legal procedure (a report or bill), (v) provides a legal decision (judgment) and makes it accessible, or (vi) fixes on paper official communications between two or more parties (e.g., an administrative-procedure document).

Within this wide range we find some legal documents that can be defined as being any text through which legal statuses are set up, and which has been issued through a legal procedure by a competent body with the purpose of expressing some legal prescription. The legal document is therefore not a trivial document and should preserve over time certain features concerning legal validity, legal authenticity, and the hierarchy of legal sources.

Now, if in fact the prescriptions and the legal statuses that can be configured are countless, it is equally true that all written references that could generate them are substantially reduced to a limited number of types of legal documents. On this premise, Akoma Ntoso has identified and schematically described three families of legal documents that seek to cover all types of legal documents produced by government bodies.

Depending on the way the information contained is organized within the text, the legal text itself can be organized in various ways. All legal documents follow a logical succession, but some of them, especially the legal documents generated by parliaments, need to comply with a specific format of text organization (to ensure clarity and accuracy). As a result, there are various types of legal documents that, depending on their function and purpose, adopt specific textual structures.

## 7.2 **Types of Legislative Documents**

When defined as an *expression* of a legal document, it relates to any of several types of documents that have different purposes and functions, as follows.

### 7.2.1 **Legislative Documents: Bills and Acts**

Bills and acts are normative documents produced through parliamentary procedures or by other competent bodies (e.g., committees). Their texts have been drafted by parliament or by another government body. They are usually drawn up according to a hierarchical structure in which the text is divided into sections or chapters. These are in turn divided into articles, sub-paragraphs, and so on.

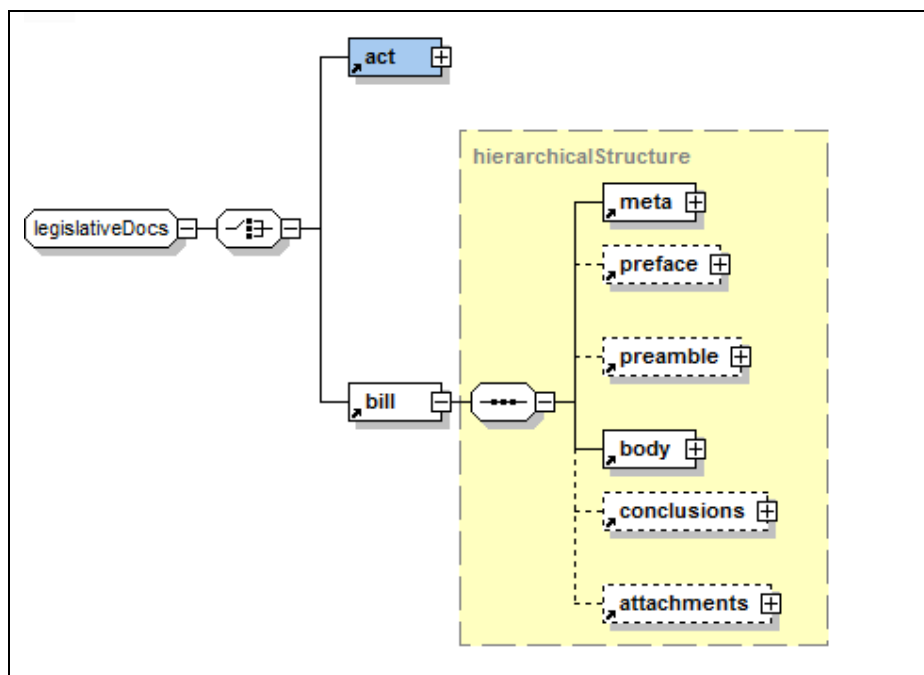


Figure 15 – Structure of a bill.

Name	Definition	Structure
BILL	A bill is a proposed law that has been introduced within a legislature and which has not yet been adopted or ratified.	Texts with a hierarchical structure. The body is the main part, where the normative text is contained.
ACT	An act is a bill or measure that has been passed into law by a legislature.	Texts with a hierarchical structure. The Body is the main part where the normative text is contained.

### 7.2.2 Amendment

An amendment is a legally binding text setting out the legislative modifications to be made to a document.

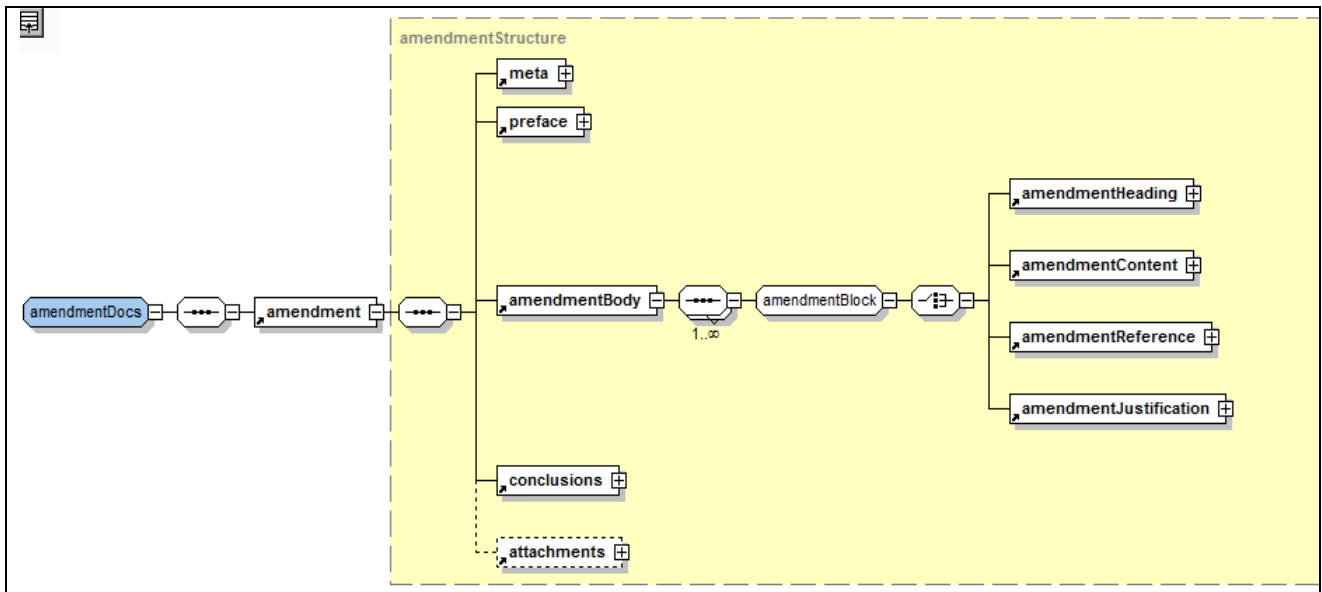


Figure 16 – Structure of an amendment.

Name	Definition	Structure
AMENDMENT	An amendment describes a modification to be applied to a bill or law.	Composed of block elements.

Clause 3 was deleted and the following substituted therefor:

**3** Section 15 of the principal Act is amended –

(a) in subsection (2) by inserting next after the words “commits an offence”, the words “whether the disclosure takes place in Jamaica or elsewhere,”;

(b) by inserting the following as subsection (4) –

“in the case of an offence under subsection (2), where outside of Jamaica, the Resident Magistrate’s Court for the Corporate Area shall have jurisdiction to hear the matter”.

New Clause 3 agreed to.

Figure 17 – Example of amendment (Jamaica)

### 7.2.3 Documents

A document is a legally valid text that lacks any specific structure.

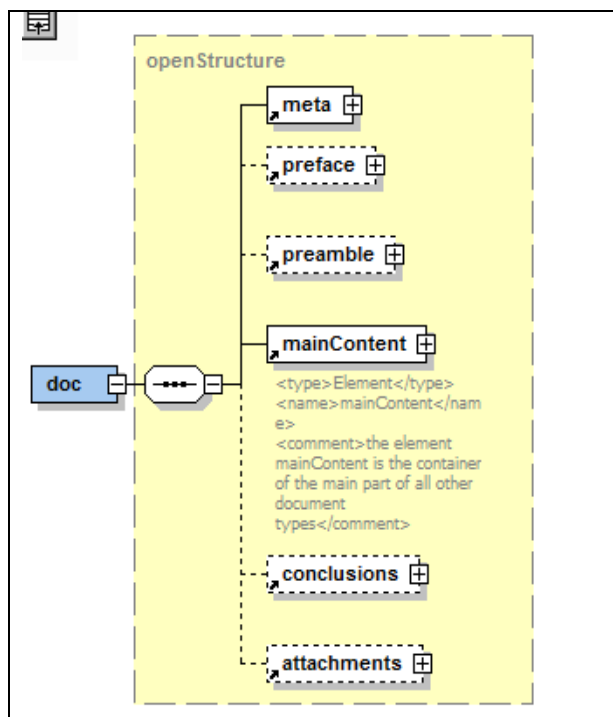


Figure 18 – Generic document structure

Name	Definition	Structure
DOCUMENT	A document is a written and legally valid text for which there is no specific structure or document type.	Texts having an open structure. The main body of the text is the main content.

## 7.2.4 Debate Documents

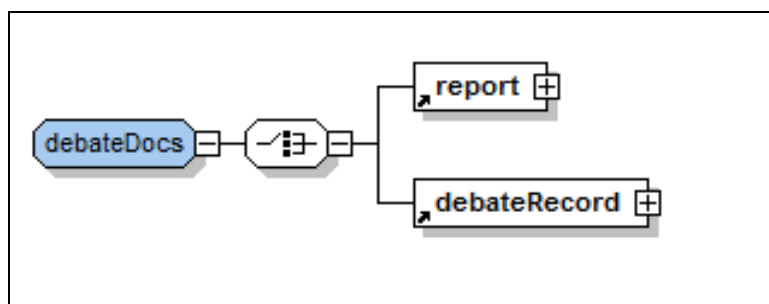


Figure 19 – Debate document structure

### 7.2.4.1 Reports

Reports include minutes, records, or any parliamentary-procedure document having no particular textual structure. An example could also be the report stating the amendments made to a bill.

Name	Definition	Structure
REPORT	A report is a document containing any written account of parliamentary proceedings.	Texts having an open structure.

In general, reports are draft summaries of a session in a chamber or of a committee meeting. These documents may also contain fragments very similar to conference stenographic debates interspersed with brief summaries. A report can include all the structures in a debate.

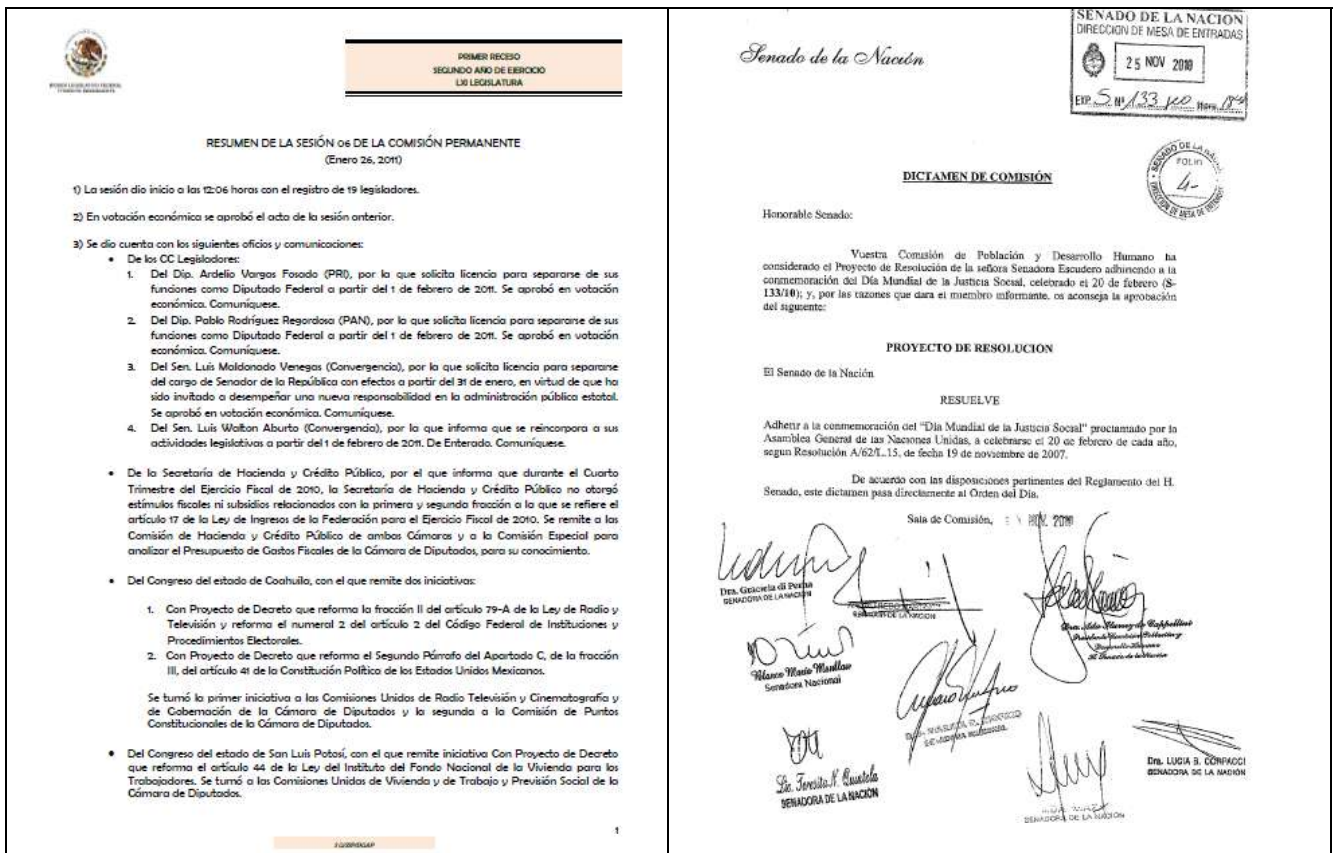


Figure 20 – Example of committee reports (Mexico and Argentina)

### 7.2.4.2 Debate Records

Debate records are texts transcribing a parliament’s working sessions or work. The transcript of a parliamentary debate or of parliamentary work must reflect the alternating sequence of questions and answers that have taken place in parliament, as well as the different points of view that have been expressed during a parliamentary debate.

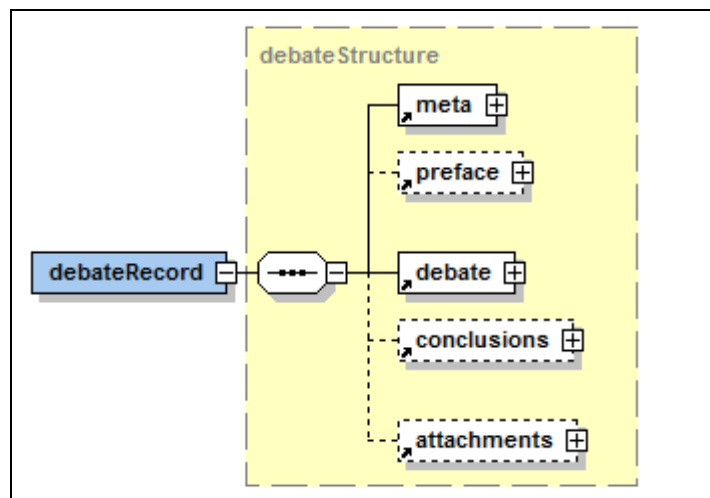


Figure 21 – Debate record structure

Name	Definition	Structure
DEBATE RECORD	A debate record is a document containing an official transcript of parliamentary discussions.	Texts having a debate structure.

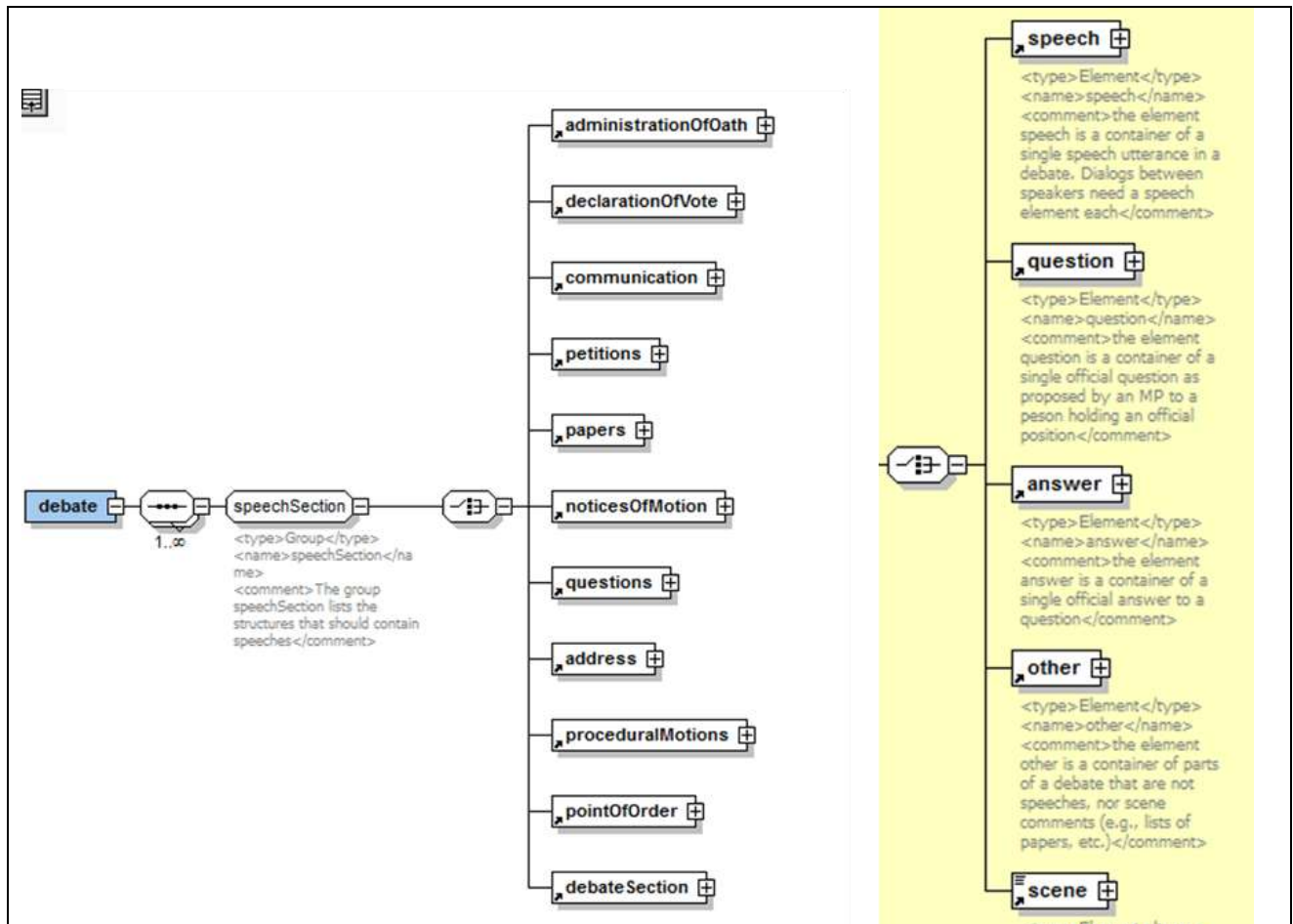


Figure 22 – The detailed structure of the lower blocks allows to capture the finest details of the debates


 <p><b>MINUTES</b> <b>OF THE</b> <b>HONOURABLE JAMAICA SENATE</b></p> <hr/> <p>At a meeting of the Members of the Senate held pursuant to adjournment at Gerles House in the City and Parish of Kingston on Thursday, the 18<sup>th</sup> DAY OF JULY, 2011</p> <p>The Senate met at 10:27 a.m. a'clock</p> <p><b>PRAYERS</b> Prayer was offered by Senator the Honourable Marlene Melchior Fenech</p> <p><b>PRESENT WERE:</b></p> <p>Senator Professor the Honourable Oswald Givens, OJ, CD, QC, President Senator the Honourable Dwight Augustus Nelson, CD, Minister of National Security and Leader of Government Business Senator the Honourable Arthur Hugh Washington Williams, Minister without Portfolio in the Office of the Cabinet with responsibility for the Public Service Senator Marlene Melchior Fenech, Minister of State in the Ministry of Foreign Affairs and Foreign Trade Senator Mark Jefferson Golding Senator Dorothy Caserio Lightbourne, CD, QC Senator Keith Desmond St. Anshyn Knight, QC Senator Dennis Meadows</p>	<p>Bill read a third time and passed.</p> <p>The Minister of National Security and Leader of Government Business, moved that a Bill entitled "AN ACT to amend the <i>Interception of Communications Act</i>", be now read a second time.</p> <p>(Senator Norman Grant entered and took his seat).</p> <p>Senator Keith Knight having spoken for 30 minutes, the Minister of National Security and Leader of Government Business moved for the suspension of the Standing Orders to enable him to continue his speech to its conclusion notwithstanding the time limit on speeches.</p> <p>Seconded by: Senator Mark Golding. Agreed to.</p> <p>On the substantive motion being put, same was agreed to.</p> <p>Clerk read Bill a second time.</p> <p>The Senate resolved itself into a committee of the whole Senate to consider the clauses of the Bill.</p> <p>Clauses 1 – 2 agreed to.</p> <p>At 12:41 p.m. the committee suspended its sitting.</p> <p>At 12:48 p.m. the committee resumed.</p> <p>Clause 3 was deleted and the following substituted therefor:</p> <p>3 Section 15 of the principal Act is amended –</p> <p>(a) in subsection (2) by inserting next after the words "commits an offence", the words "whether the disclosure takes place in Jamaica or elsewhere,";</p> <p>(b) by inserting the following as subsection (4) –</p> <p>"in the case of an offence under subsection (2), where outside of Jamaica, the Resident Magistrate's Court for the Corporate Area shall have jurisdiction to hear the matter".</p> <p>New Clause 3 agreed to.</p> <p>Title and Enacting clause agreed to.</p> <p>The question that the Chairman do report the Bill to the Senate was agreed to.</p>
--	--

Figure 23 – Example of a senate debate of Jamaica

## 7.2.5 Judgments

Judgments are the documents representing court rulings that become case law or precedent. They must be drawn up according to a typical distinctive structure.

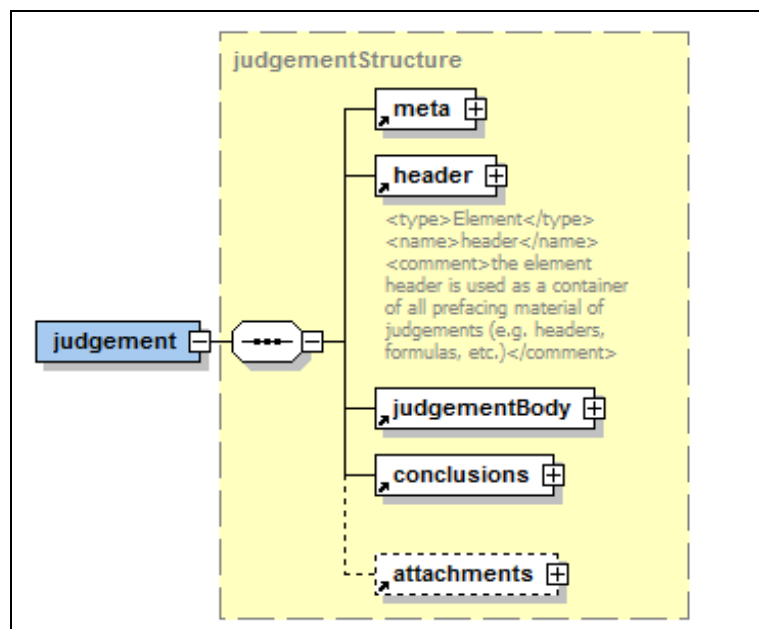


Figure 24 – Structure of a judgment

This type of document is not generally used in parliaments, since the judicial function lies beyond the scope of parliamentary authority. However, it may be the case that a law is modified by a judgment (by judicial review) or that a parliamentary debate contains as an attachment an extract of a judicial decision. In these cases, you can use this type of document and the corresponding tag to obtain a complete session record.

Name	Definition	Structure
JUDGMENT	A judgment is a document stating the decision which determines the outcome in a case brought before a court of law.	Texts having a judgment structure, divided in four main blocks: background (facts), introduction, grounds, and decision.

### 7.2.6 Document Collections

A document collection is any folder (such as that containing a bill) that is usually composed of several documents (cover, motivations, commission report, amendments, first draft of a bill, amended bill, etc.).

It is thus possible to represent a unique XML file document composed of different autonomous parts. The following example shows a bill, with an explanatory memorandum document and, at the end, the fragment of an article amended in the bill.

```

- <akomaNtoso xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
  xsi:schemaLocation="http://www.akomantoso.org/1.0 ./akomantoso10.xsd"
  xmlns="http://www.akomantoso.org/1.0">
- <documentCollection>
+ <meta>
- <collectionContent>
+ <bill>
+ <Interstitial id="Int1">
- <doc name="memorandum">
+ <meta>
+ <preface>
+ <mainContent>
+ <conclusions>
</doc>
- <doc name="amendmendArticle">
+ <meta>
+ <preface>
+ <mainContent>
</doc>
</collectionContent>
</documentCollection>
</akomaNtoso>

```

Figure 25 – Structure of document collection, in this case showing as the process of introducing and amending a bill

Certain types of documents, usually made of several distinct and autonomous documents, are modeled like amendmentLists and officialGazettes. The type documentCollection is a generic document type for representing any kind of collection container.



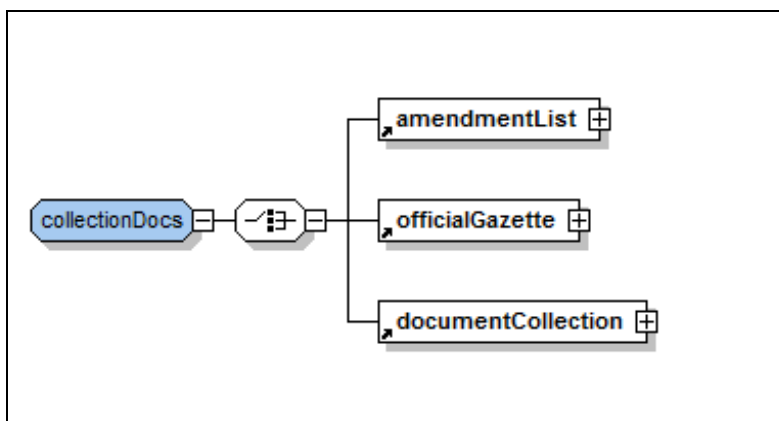


Figure 26 – Structure of document collection

Name	Definition	Structure
AMENDMENT LIST	An amendment list is a report listing a series of amendments.	Complex structure including amendments and parts of the text by which an amendments is introduced.
OFFICIAL GAZETTE	An Official Gazette ( <i>Gaceta</i> ) or Official Bulletin ( <i>Diario Oficial</i> )	Official publishing source of law composed of an assortment of legal documents (laws, decrees, orders, legal notices, etc.).

### 7.3 Legal Documents: An overview

All different kinds of legal documents are drafted in accordance with a logical succession, so it is possible to find some common structural elements that can be defined as blocks. With some simplification for a clearer understanding, a legal document—and in particular a legislative one—can be understood as having the following tripartite structure.

#### 7.3.1 The Tripartite Structure of a Legal Document

<b>Front matter</b>
In this introductory part we can find information enabling us to identify the type of document. For example, we will typically find the title, number, the issuing authority, and the document’s legal basis.
<b>Text body</b>
The main part of the document, where the content lies. The main body can have different structures depending on the type of document and its purposes.
<b>End matter</b>
This is where we find closing formulas, the date, and the signatures.

Any legal document will make it easy to identify the three main blocks described above, but a more detailed analysis will reveal the text’s complexity, which cannot be ignored.

The opening part of a text, for example, contains different kinds of information:

- Information enabling us to determine where, when, and by whom the document was published, along with various other elements that represent the framework that allows the document to be put into context (this type of information is called metadata).
- Information intrinsic to the text, such as the document's title, serial number, and issuing authority.
- Information setting out the purposes and legal basis of the document.

In this regard, the opening part of a text is composed of different pieces of information which may or may not recur, depending on the type of document that we have. Even the text in the main part of the document, where the essential content is, can be observed to have a structural complexity that can vary depending on the document's type and purpose.

Only the final part of the document does not present the same content or structural complexity, since its function is essentially to provide a date and a signature for the document.

It should also be borne in mind that the legal document can have attachments completing and integrating the content in the main text.

The table below lays out the main structural components of legal documents, summarizing their features and purposes.

<b>Text</b>	<b>Structural elements that may occur</b>	<b>Typical layout of the text body</b>	<b>Types of documents where the element may occur</b>
<b>Front matter</b>	PREFACE Does not always occur	Blocks of text	ALL DOCUMENT TYPES
	PREAMBLE Does not always occur	Blocks of text	ACT/BILL DOC/REPORT AMENDMENT
	HEADER (occurs only in the Judgment structure)	Blocks of text	JUDGMENT
<b>Main part of text (Always occurs)</b>	BODY (of law)	Hierarchical structure	ACT/BILL
	AMENDMENTBODY	Blocks of text	AMENDMENT
	DEBATE	Debate structure	DEBATERECORD
	MAINCONTENT	Open structure	DOCUMENT REPORT
	JUDGMENT BODY	Judgment structure	JUDGMENT
<b>End matter</b>	CONCLUSIONS (Does not always occur)	Blocks of text	ALL DOCUMENT TYPES
<b>Additional documents</b>	ATTACHMENTS	Blocks of text	ALL DOCUMENT TYPES

As we can see, not all the elements in the template above will occur in every legal document: they have been included only as an example to provide a full picture of what a document would look like when all elements are present.

#### 7.4 Naming Legislative Documents

In keeping with the FRBR<sup>21</sup>, a standard adopted by the IFLA Study Group on the Functional Requirements for Bibliographic Records, each bibliographic document should be conceived from three points of view:

- as a Work, that is, a distinct work of authorship, an author’s intellectual or artistic creation of the mind, e.g., Shakespeare’s Hamlet;
- as an Expression, that is, a distinct intellectual or artistic creation of the mind through which a Work is expressed, interpreted, or otherwise represented, e.g., Zeffirelli’s 1990 movie of the same name (Hamlet); and
- as a Manifestation, that is, the physical embodiment of a given Expression, e.g., the DVD on which the movie is recorded.

In our case, the legal document is interpreted as a bibliographic resource, accordingly identified and named from three different points of view: as a work, an expression and a manifestation. As a Work, the document bears the name of the law it represents (e.g., Ley 34); the Work will in turn contain parts that can be associated with a specific Expression (e.g., an amended part of Ley 34); and finally there will be a Manifestation (e.g., the XML file representing the Ley 34).

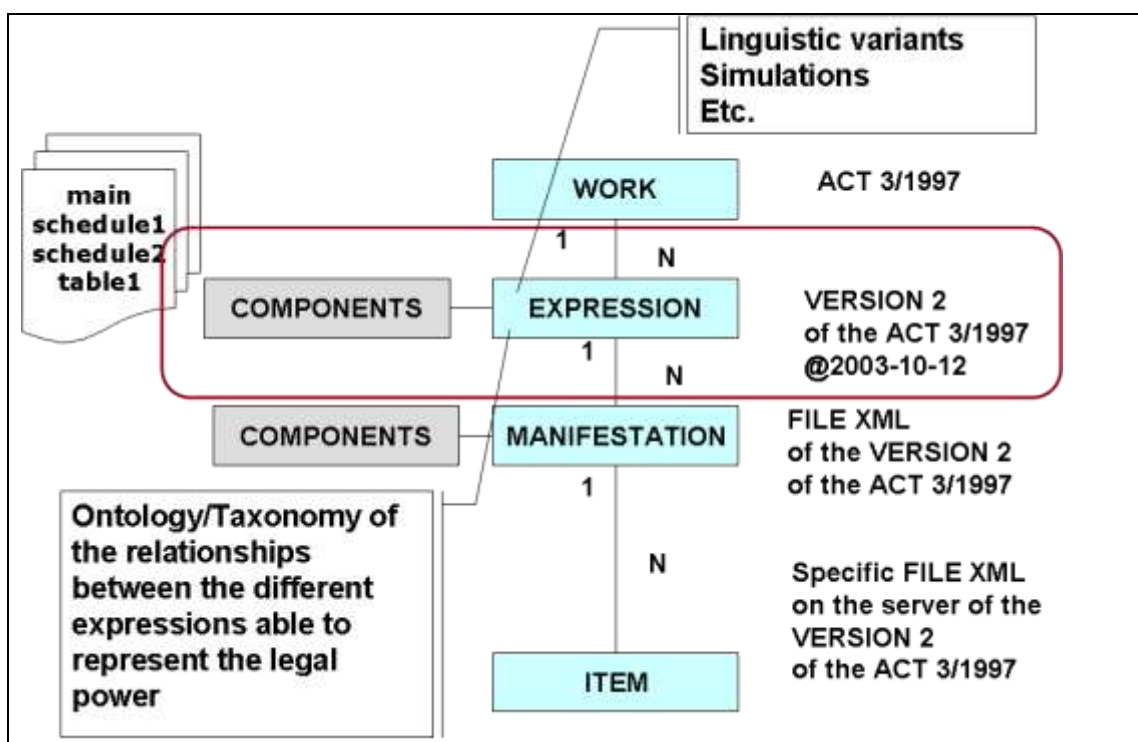


Figure 27 – Scheme of an FRBR structure.

It is therefore important to determine at this stage which parts of the entire document are to be converted into an XML Manifestation and which parts are best kept in other formats (such as PDF or TIFF). We must accordingly assess the main document, its annexes, and table of contents and identify an appropriate type of document for each of them.

<sup>21</sup> Functional Requirements for Bibliographic Records.

## 7.5 Naming Legislative Resources: Defining the URI

For each legislative resource the expert should identify the URI taking into account the three main aspects previously considered, thus looking at the resources as a Work, as an Expression, and as a Manifestation.

It is therefore important to define the type of the document, the country where the corresponding law was enacted, the main language, the date of the document, and its version if more than one are available.

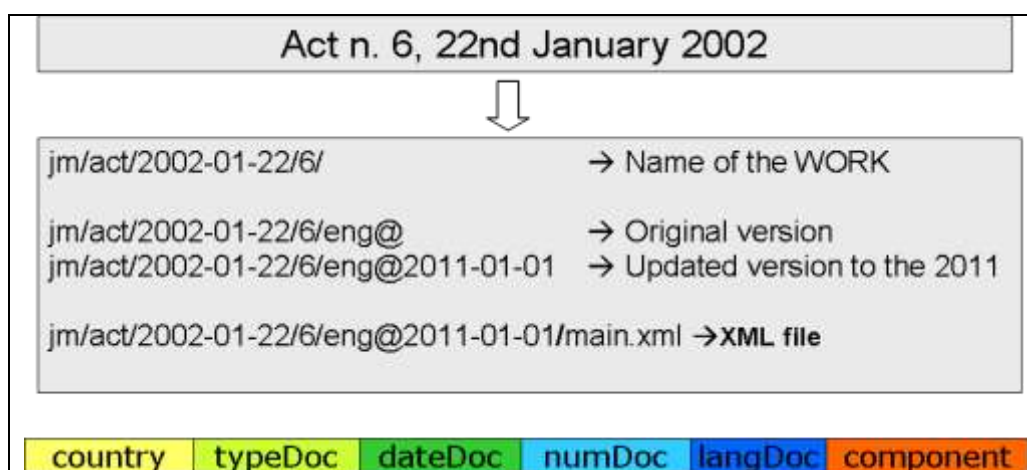


Figure 28 – Scheme of the URI composition.

On the other hand, a document can be composed of different parts, such as annexes, exhibits, and tables, or it may contain a number of other official documents. It is therefore essential, when identifying a URI, that we also fully analyze the structure of the document's components so as to separate the way the content has been *logically* organized by the author (i.e. parliament for legislative documents, a judge for judicial ones) from the way it has been *physically* organized, usually on the basis of technical criteria. In other words, the Work URI should reflect the author's original logical structure, so as to preserve the original forms and hierarchy of the annexes over time or that of the other material making up the full document. The physical organization can follow different criteria depending on the purposes of the application purposes or on technical choices. Although we might find three components in the URI at the Work level, there may be a single, unique URI component at the Manifestation level, which will make the document easier to manage.

## 7.6 Legislative Documents Metadata

The metadata in the Akoma Ntoso model resides in a part of the XML document separated from the description and modeling of the content (the text adopted by the issuing organs). This is done to ensure a long-term and a barrier that fully separates what is legally approved by the competent bodies from the content's subjective annotations, which have no legal value (that do not make law), and which may result in discrepant interpretations.

The mechanism through which the metadata can be connected to the text can be explained by considering an example. Suppose we have an amendment made during a parliamentary session and we want to model that amendment in XML. The basic structure will be as follows:

```

<?xml version="1.0" encoding="UTF-8" ?>
<!-- <?xml-stylesheet type="text/xsl" href="./styles/mexico.xsl"?> -->
- <akomaNtoso xmlns:xsl="http://www.w3.org/2001/XMLSchema-instance"
  xsl:schemaLocation="http://www.akomantoso.org/1.0 ./akomantoso10.xsd"
  xmlns="http://www.akomantoso.org/1.0">
- <amendment>
+ <meta>
+ <preface>
- <amendmentBody>
  + <amendmentHeading>
  + <amendmentContent>
  + <amendmentJustification>
  </amendmentBody>
+ <conclusions>
</amendment>
</akomaNtoso>

```

Figure 29 – Basic schema of an amendment (Mexico).

In the example, the structure makes a clear separation between the `<meta>` block and the `<amendmentBody>` block containing the amendment's original text.

The `<meta>` block contains ten sections expressing and regrouping metadata according to their function (see below), and interspersed between these section we will also find `references`, which provide information relative to each person, organization, and function mentioned in the document, along with other information. Detailed boxes identifying people (a Member of Parliament, minister, etc.), institutions (president's office, secretariat, commission, etc.), and roles (minister, president, etc.) may be stored in a database or in a collection of Web pages or described through OWL ontologies. Where and how people boxes are described has nothing to do with the modeling of the XML document, but certainly any person mentioned in the text can be referenced by attaching a reference to the metadata. This way we will be able to query the collection of XML documents with the following command: "Show me all the amendments proposed by Senator Javier Castellón Fonseca."

In our case, the reference block will contain the following metadata:

```

<references source="#bungeni">
  <original id="ro1" href="/mx/amendment/2010-01-01/main/" showAs="Amendment"/>
  <activeRef id="ra1" href="/mx/decree/2010-10-07/85/main/" showAs="Decree Num. 85"/>
  <TLCRole id="senator" href="/ontology/organizations/pm/president" showAs="Senator"/>
  <TLCRole id="author" href="/ontology/roles/pm/author" showAs="Author of Document"/>
  <TLCRole id="editor" href="/ontology/roles/ita/editor" showAs="Editor of Document"/>
  <TLCOrganization id="bungeni" href="/ontology/organization/ken/bungeni" showAs="Bungeni"/>
  <TLCPerson id="castellon" href="/ontology/persons/pm/authority/castellon" showAs="San Francisco
  Javier Castellon Fonseca"/>
  <TLCPerson id="palmirani" href="/ontology/persons/ita/editors/palmirani" showAs="Monica Palmirani"/>
</references>

```

Figure 30 – Fragment of a reference block

The text will have a paragraph citing Senator "Javier Castellón Fonseca": the metadata so modelled should be attached through the attribute `refersTo`, and its role is expressed through the attribute `as`.

```

<conclusions>
  <p>
  Senate Chamber's Session Hall, on <docDate date="2010-10-07">October the 7th, 2010.</docDate>
  <docProponent refersTo="#castellon" as="#senator"> Francisco Javier Castellon
  Fonseca</docProponent>

```

```
</p>
</conclusions>
```

Figure 31 – Text fragment showing conclusions and signatures

Elsewhere in the XML we will also have the legal classification of the operations proposed with this single piece of text: input, replacement, cancellation, etc. The metadata through which such legal classes are annotated is called *analysis*. This part defines the modifications made (`type="insertion"`), the part of the document where the proposal appears (`<source href="#mod1"/>`), and finally the part where it should be applied (`<destination href="/mx/decreto/2010-10-07/85/main#art3"/>`).

```
<analysis source="#palmirani">
  <activeModifications>
    <textualMod id="txt1" type="insertion">
      <source href="#mod1"/>
      <destination href="/mx/decreto/2010-10-07/85/main#art3"/>
    </textualMod>
  </activeModifications>
</analysis>
```

Figure 32 – Analysis text fragment

In short, we have a separation between what is objectively relevant (text structure) and what is attached for a personal or legal interpretation:

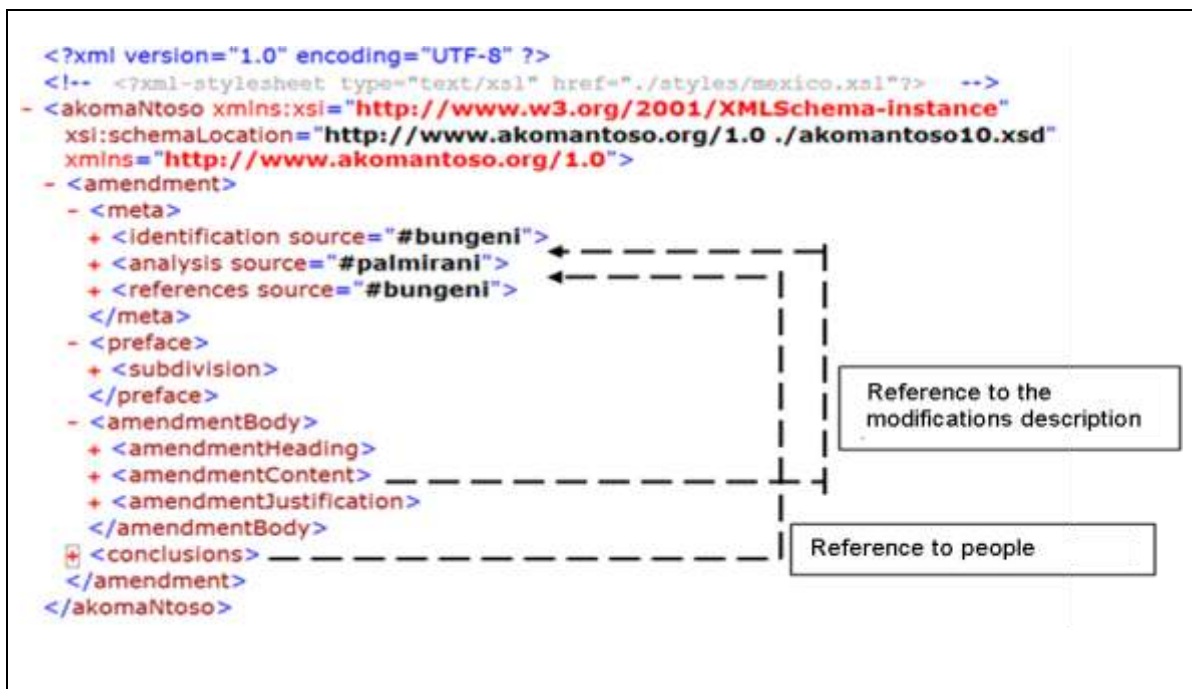


Figure 33 – XML tree showing the connection between text and metadata.

### 7.6.1 Metadata in Akoma Ntoso

In the `<meta>` block we can distinguish ten main sections as follows:

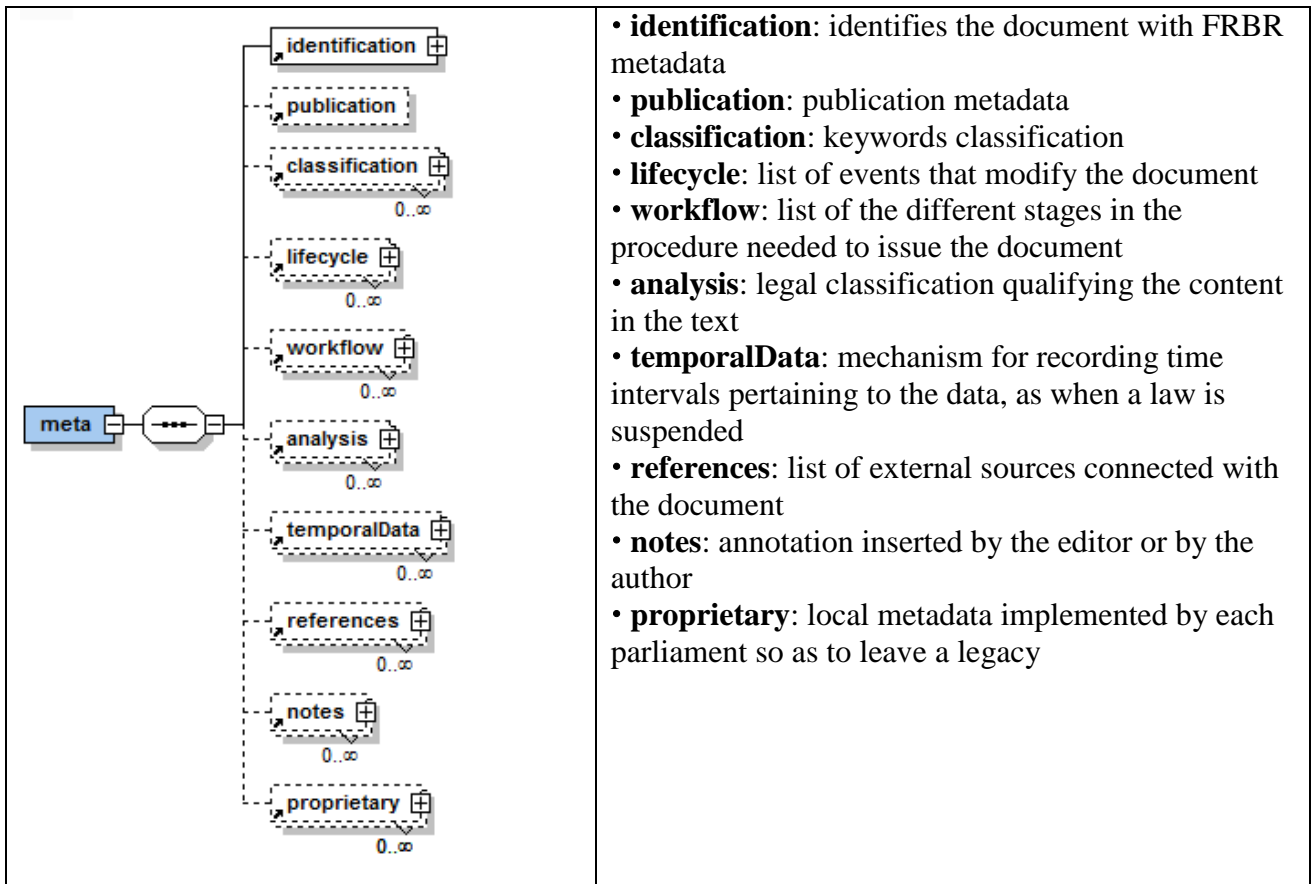


Figure 34 – Schema of metadata in Akoma Ntoso

**Identification.** This block identifies the document with the FRBR metadata and assigns the URI to each of the three levels on which legal resources are considered, that is, as Works, Expressions, or Manifestations. It focuses particular attention to the components (attached) as part of the complete legal document. The example below shows the use of metadata blocks in a debate document.

<pre> &lt;identification source="#bungeni"&gt;   &lt;FRBRWork&gt;     &lt;FRBRthis value="/mx/debaterrecord/2011-01-26/main"/&gt;     &lt;FRBRuri value="/mx/debaterrecord/2011-01-26"/&gt;     &lt;FRBRdate date="2011-01-26" name="generation"/&gt;     &lt;FRBRauthor href="#parliament" as="#author"/&gt;   &lt;/FRBRWork&gt;   &lt;FRBRExpression&gt;     &lt;FRBRthis value="/mx/debaterrecord/2011-01-26/eng@/main"/&gt;     &lt;FRBRuri value="/mx/debaterrecord/2011-01-26/eng@"/&gt;     &lt;FRBRdate date="2011-02-02" name="markup"/&gt;     &lt;FRBRauthor href="#palmirani" as="#editor"/&gt;   &lt;/FRBRExpression&gt;   &lt;FRBRManifestation&gt;     &lt;FRBRthis value="/mx/debaterrecord/2011-01-26/eng@/main.xml"/&gt;     &lt;FRBRuri value="/mx/debaterrecord/2011-01-26/eng@.akn"/&gt;     &lt;FRBRdate date="2011-02-02" name="publication"/&gt;     &lt;FRBRauthor href="#palmirani" as="#editor"/&gt;   &lt;/FRBRManifestation&gt; &lt;/identification&gt; </pre>	<p>Identification using the FRBR standard</p>
---	---

Figure 35 – Example of an identification-metadata block.

**Publication.** The publication metadata records the information relating to the legal document’s official publication. This information provides public proof of the existence, validity, and authenticity of the document under the law of the legal system in question.

<pre>&lt;publication date="2007-07-29" name="Law Report" showAs="Diario de dias"/&gt;</pre>	<p>publication</p>
---	--------------------

Figure 36 – Example of publication metadata block.

**Classification.** In this block the documentalist can write in keywords by which to classify the document (e.g., “Bill”). At some point the assembly will deliberate to use those keywords in the text, and so a double entry is required: one forming part of the content (in the text) and another in the classification metadata block as semantic data.

<pre>&lt;classification source="#bungeni"&gt;   &lt;keyword value="Human Right" showAs="human"   dictionary="UNVOC"/&gt;   &lt;keyword value="Family Law" showAs="family"   dictionary="UNVOC"/&gt; &lt;/classification&gt;</pre>	<p>classification</p>
---	-----------------------

Figure 37 – Example of metadata block classification.

**Lifecycle.** The lifecycle metadata block provides a list of every event that modifies the document over time. This metadata is particularly useful in tracking the changes made to the document. This mechanism makes it possible to create software that supports the process by which the document is consolidated, producing real-time updated versions of the bill or law that the document represents.

<pre>&lt;lifecycle source="#bungeni"&gt;   &lt;event date="2007-07-25" id="e1" source="" type="generation"/&gt; &lt;/lifecycle&gt;</pre>	<p>lifecycle</p>
--	------------------

Figure 38 – Example of the lifecycle metadata block.

**Workflow.** This metadata block includes all the procedural events leading up to the point where the document was issued in an official form. This is distinguished from the lifecycle events, since not all the events a document goes through result in textual changes with legal effects (e.g., a debate during a session of parliament will not necessarily eventuate in a resolution affecting the text’s content). Such workflow events are mostly the result of administrative procedures carried out in compliance with the regulations of a parliament or national assembly.

<pre>&lt;workflow source="#cirsfid"&gt;   &lt;step id="step1" date="1979-01-01" actor="#assembly"   outcome="#firstReading" as="#legislator"&gt;     &lt;myTags:proprietary source="#ecuador"&gt;       &lt;myWorkFlowTags&gt;       &lt;/myWorfFlowTags&gt;     &lt;/myTags:proprietary&gt;   &lt;/step&gt;   &lt;step id="step2" date="1979-05-01" actor="#assembly"   outcome="#secondReading" as="#legislator"/&gt;   &lt;step id="step4" date="1979-10-01" actor="#assembly"</pre>	<p>workflow</p>
---	-----------------



<code>&lt;outcome=#thirdReading as=#legislator"/&gt; &lt;/workflow&gt;</code>	
---	--

Figure 39 – Example of a workflow metadata block.

**Analysis.** This metadata block makes it possible to annotate statements about legal provisions, thereby describing the content in a semantic way (e.g., labeling something as a modification, or using Shepard’s Citations to verify a legal citation in a judgment and classify that citation as “good law or “bad law”).

**References.** Reference blocks record all dealings with external sources connected with the document, including the link to the ontology part.

<code>&lt;references source=#bungeni&gt;   &lt;TLCOrganization id="bungeni"   href="/ontology/organizations/ken/bungeni" showAs="Bungeni"/&gt;   &lt;TLCOrganization id="parliament"   href="/ontology/organizations/gha/parliament" showAs="Parliament"/&gt;   &lt;TLCRole id="author" href="/ontology/roles/mx/author"   showAs="Author of Document"/&gt;   &lt;TLCRole id="editor" href="/ontology/roles/ita/editor"   showAs="Editor of Document"/&gt;   &lt;TLCRole id="speaker" href="/ontology/roles/mx/president"   showAs="The President"/&gt;   &lt;TLCRole id="mes" href="/ontology/roles/mx/secretary"   showAs="The secretary"/&gt;   &lt;TLCPerson id="palmirani"   href="/ontology/persons/ita/editors/palmirani" showAs="Monica   Palmirani"/&gt;   &lt;TLCPerson id="marin"   href="/ontology/persons/mx/parliament/JorgeCarlosRamírezMarín"   showAs="Jorge Carlos Ramírez Marín" shortForm="Jorge Carlos   Ramírez Marín"/&gt;   &lt;TLCPerson id="olmos"   href="/ontology/persons/mx/parliament/JohnGidisu" showAs="Paula   Angélica Hernández Olmos" shortForm="Paula Angélica Hernández   Olmos"/&gt;   &lt;TLCPerson id="maaf0"   href="/ontology/persons/mx/parliament/JohnOsaf0Maaf0"   showAs="Mr. Yaw Osaf0-Maaf0" shortForm="Mr. Osaf0-Maaf0"/&gt; &lt;/references&gt;</code>	references
--	------------

Figure 40 – Example of metadata block references.

**Notes.** This block is where annotations made either by the author or by the editor are included. Special notes are those consolidation notes that explain the effect of the amendment.

<code>&lt;notes source=#bungeni&gt;   &lt;note id="not1"&gt;   &lt;p&gt; Some footnotes from author or editors.&lt;/p&gt;   &lt;/note&gt; &lt;/notes&gt; &lt;/meta&gt;</code>	notes
---	-------

Figure 41 – Example of metadata block notes.

**Proprietary.** This block makes it possible to add new metadata according to the purposes of the local information system. For any proposal package found to be inadequate, Akoma Ntoso specifies a mechanism to add new metadata elements depending on local needs and norms. This makes it possible to specify sets of metadata elements for local application and to specify tools, without affecting the ability to share and reuse the same documents.

## PART III

### Tools

In order to fully implement a Legislative XML standard we have to use a set of software tools that can help parliaments apply legal XML efficiently, making it less costly and time-consuming to put out legislation. We can distinguish the various actors involved and can then identify the types of software suitable for each of them:

- The LEGISLATIVE OFFICE is tasked with translating existing documents in various formats (HTML, DOC, RTF, etc.) or with producing the new documents required by the legislative process. At each stage of the process, the personnel staffing the legislative office must also produce consolidated versions of the bill, so that when parliament convenes to debate the bill, it works on its latest version.
- The GENERAL SECRETARIAT of PARLIAMENT has to govern the whole lawmaking procedure, which includes voting on the amendments, implementing them, issuing conference reports, and voting on the bill to finally make it into law.
- Parliament's PRINTING OFFICE is tasked with printing the latest version of the text, and must often also do so using a layout that makes it possible to compare versions where changes have been made.
- The CITIZEN must have access to updated documents, including its different versions and must be enabled to consult links to resources in a coherent manner, with the possibility of performing complex searches in the semantic parts of the document.
- EXTERNAL APPLICATIONS (e.g., regional databanks) must be able to refer to documents published on the parliament website using permanent, significant, and invariable links, with the possibility of also downloading XML documents to support advanced applications for public documents.

In regards to legislative software tools, these can be broken down into two broad groups:

- back-office, i.e., those which support the production and management of legislative documents;
- front office, i.e., those which make it possible to consult, acquire, and display documents for citizens or for other software (e.g., databanks, spider, indicators, etc.).

The back-office tools include the following:

- SPECIALIZED TEXT EDITORS for XML markup. This class of software consists of word processors designed to (i) ensure that standards and metadata are correctly applied; (ii) help users in the markup phase in a transparent manner, that is, without requiring them to have a deep knowledge of XML standards; (iii) help users implement standards of sound regulation, in keeping with the legal-drafting manuals used by parliaments; (iv) facilitating repetitive manual markup; (v) automate to the extent possible the markup of those parts of the text that can clearly be identified (e.g., the document structure and normative references); (vi) facilitate the consolidation of approved amendments; and (vii) provide a friendly interface enabling users to organize their work in the various stages of the lawmaking process.
- Automatic text-recognition ANALYZERS, used to process previous documents or those coming from other government institutions that participate in the legislative process.
- XML DATABASES, for storing the marked up texts and for managing and verifying each document's different versions.
- WEB-INTEGRATED PLATFORMS, for managing parliamentary workflow.

The front-office tools are the following:

- LINK SOLVERS, enabling citizens and external applications to connect to parliament's digital document resources.

- XML CONSULTATION WEBSITES, with texts having semantic search forms.

## 8. Specialized Legislative XML Editors

### 8.1 *Text Processor Editors*

Text editors are an essential tool in managing projects that channel legislative documents into an XML platform. There are specialized tools that make it possible to create and tag legislative documents and convert them into an XML format, which also guide the user to draw-up texts in keeping with legal-drafting rules and the technical XML schema. Editors guide those who staff parliament's legislative office and committees, enabling them to simplify repetitive passages, all the while improving the legal content of the documents themselves.

A good text editor for legislative markup must have certain characteristics, such as:

- a. It should serve as an intermediary between the user and the XML syntax. In theory, a good editor will allow a user to mark up a text without knowing the technical aspects of XML.<sup>22</sup>
- b. It should guide the user in proper markup, suggesting standards of sound regulation and providing quality control where these standards are not included in the XML schema. For example, the XML schema makes it possible for a bill to have more than one title, but the editor might prevent that situation from happening by pointing it out as an error.
- c. The editor should enable users to rely on automatic tools for repetitive and burdensome tasks, such as marking up a document's structure and normative references. It is important for an editor to have the ability to enable operations and controls based on context.
- d. The editor must, at all times, make it possible to convert the document into XML and view it in a format that the end users can understand, enabling at the same time multi-channel formats (PDF, XHTML, etc.).
- e. The editor's interface should be organized not on the basis of the XML schema but on the basis of the user's work and of the lawmaking process's internal organization.

Text editors for XML markup of legislative documents can be divided into three broad classes:

- a. **Text editors based on word processors.** These editors use applications (word processors) already on the market, with settings and an interface the end user is typically already familiar with. They translate the markup into the underlying application's internal format (e.g., ODT for the Open Office word processor, the proprietary DOC format for Microsoft Word), and at the user's request it will semantically check the enriched document and convert and validate it according to the chosen XML schema. These editors thus have a module by which to import and export XML files. Two editors in this group are Norma-Editor and Bungeni-Editor.

**Disadvantages.** These editors do not regularly check what the user types: this check is triggered only when a certain amount of writing or markup has been reached, and so it is only at the *end* of a process that they can verify whether a standard is being properly used, not *while* it is being used: they cannot guarantee an immediate compliance with the standard. On a positive note, this means that the user can work without being interrupted by error messages.

---

<sup>22</sup> *What you see is what you get* (WYSIWYG). This phrase describes a system that enables users to work in a graphical format—through an interface that displays the text as it will appear to the reader, rather than as the system represents it—without having to use the underlying code.

**Advantages.** The editor's internal data format allows users to easily switch between different XML standards at the conversion stage. And so the same document can be easily converted into Akoma Ntoso or into another similar standard, and the standard can be updated without expending too much effort customizing the editor. No doubt another advantage is the user-friendly interface. Generic text editors on the market provide functions enabling sophisticated human-computer interaction, as through contextual menus, right-clicking, and drag-and-drop. Another advantage is that users are often already familiar with the generic text editor's working environment, and that reduces the learning curve. Finally, we must also consider the license: information systems often have policies that make it possible to purchase proprietary product licenses at a discount; otherwise, you can always opt for specialized software based on Open Office, which is open source and freely distributed.

- b. Editors based on a native XML editor.** These editors are guided by the rules of the standard XML schema and can at all times check for compliance with such rules. This may actually prove to be a limitation, because operations that facilitate the user's work often do so by blocking the XML schema structure, and native XML editors do not allow that. Any yet, at the drafting stage, it is often desirable to have greater flexibility, and only later verifying compliance with the standard, once the drafting is complete. These editors are based on validated XML that can be open source (e.g., Java) or proprietary (e.g., XMetal or Oxygen). It is time-consuming to develop them, because you have to design the interface interaction from scratch, and the result is unlikely to be as fine and elegant as with professional text editors. Finally, the user must markup following the logic on which the XML standard is based, which sets priorities during markup. However, it may make more sense for the user to follow the markup process without constant monitoring. Some examples of these editors are the Xlegex, developed by ITTIG-CNR Italy; VoxLex, developed by the University of Amsterdam; the editor of the House of Representatives of the United States, based on XMetal or LegisPro in the state of California.
- c. Web-based editors.** There are text editors on the Web. GoogleDoc is an example; the masks found in various Web-mail portals are another. The idea of writing a text, sharing it with others, and handling plural Web applications is encouraging and has led some developers to design software for the XML markup of legislative texts, too. However, there are several problems in the current state of the art. This technology provides *a very basic interface with unsophisticated legal-drafting tools*, and when the time comes to synchronize an action with its visual outcome on the Web, the process is often confusing or, worse, it may lead to error (for example, we may enter a keyboard command and not see its output displayed, so we press the keystroke multiple times without realizing that the Web server is actually synchronizing with the client in the meantime.) There is also the problem that a Web editor is dependent on the Internet and cannot work offline, that is, without being connected to the Internet. And yet it is often convenient to be able to work offline, while travelling, for example. To be sure, this problem could be solved by installing a local Web server, but this solution is complex and also entails the further problem of *synchronizing* the files on the local network with those on the Web. In summary, native XML editors are best when used for short and focused tasks, as is the case with the AM4EP editor of the European Parliament, designed to write and submit amendments to a bill directly through the Web as if writing an e-mail. In fact, because amendments consist of just text content, their wording will generally be specific and the task of updating the corresponding XML document will therefore be standard and reasonably simple.

### 8.1.1 Norma-Editor

Norma-Editor<sup>23</sup> is an editor developed in VisualBasic.NET in 2002 by CIRSIFID (University of Bologna) as an extension of MS Office Word XP. Its purpose is to guide the user in an easy and intuitive way in marking up in XML pre-existing documents or document fragments and to keep the legal corpus they represent updated, by using features that facilitate the creation of consolidated texts. Norma-Editor has several versions and is currently being used by the Italian Court of Cassation, which has already marked more than 50,000 different documents taken from the Italian Official Gazette (*Gazzetta Ufficiale*). These documents are then enriched with metadata classification to provide a database for judges. Norma-Editor has also been in use by various national and local authorities (municipalities, agencies, and regions).

Norma-Editor has been customized in international versions (English, French, Spanish, and Portuguese) to produce documents for NIR (NormeinRete) and Metalex/CEN. A version has been developed as well for African parliaments (Norma-Africa) with the support of UNDESA to mark up parliamentary documents in keeping with the Akoma Ntoso standard.

Norma-Editor is specialized in the markup of documents already approved by legislative bodies. Therefore, it does not handle all internal parliamentary documents, such as committee reports, parliamentary debates, agendas, drafts, voting, etc. However, it can effectively manage bills and amendments to produce a consolidated text of a bill for presentation to a parliamentary assembly or to a committee before discussion.

The main features of Norma-Editor are as follows:

- XML markup of existing texts (such as those extracted from an official gazette) using a contextual, colour-coded interface
- automatic recognition that checks the document's structure and normative references
- management of tables
- automatic recognition of some important metadata
- automatic markup of publication notes
- management of user notes
- management of the hierarchy of attachments
- semi-automatic management of the consolidation process
- automatic management of consolidation notes explaining the action to be performed
- management of multimedia, hypertext links, and various Web forms
- text comparison
- PDF production of marked-up texts from an XML source
- • markup-error reporting
- • automatic synchronization of URIs in the internal references

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<sup>23</sup> On the Web at <http://codexml.cirsfid.unibo.it/>.

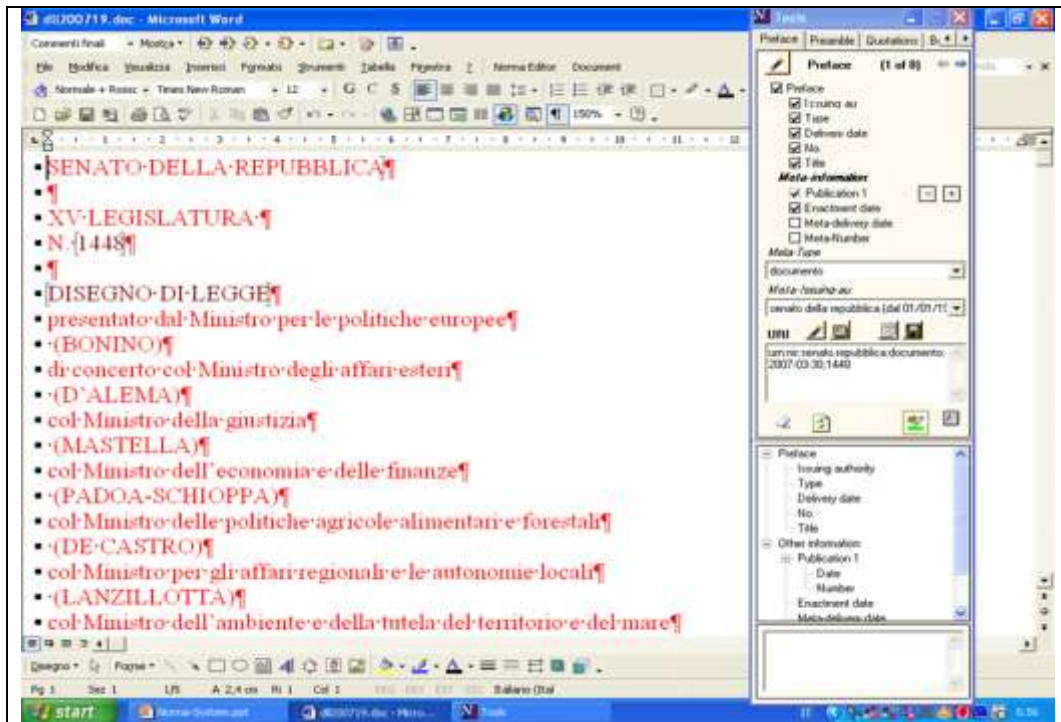


Figure 42 – Example of markup on an Italian Senate bill.

In this example you can see in red the parts that have been automatically recognized by the editor. The parser recognizes how the document is structured and uses a list of stock phrases found in different types of documents in the various conversions. Based on a standard structure, and taking into account the stock phrases to outline the macro-sectors of the document, the parser identifies the document's main parts and then proceeds with the internal identification of each individual block. This technique thus depends on the language, on a document's standard structure, on stock phrases, and natural-language expressions. Customizing the parser for a given language and normative context will take at least six months' work, as there is a need to undertake a legal analysis of documents, extract set phrases, write the rules, and run tests.

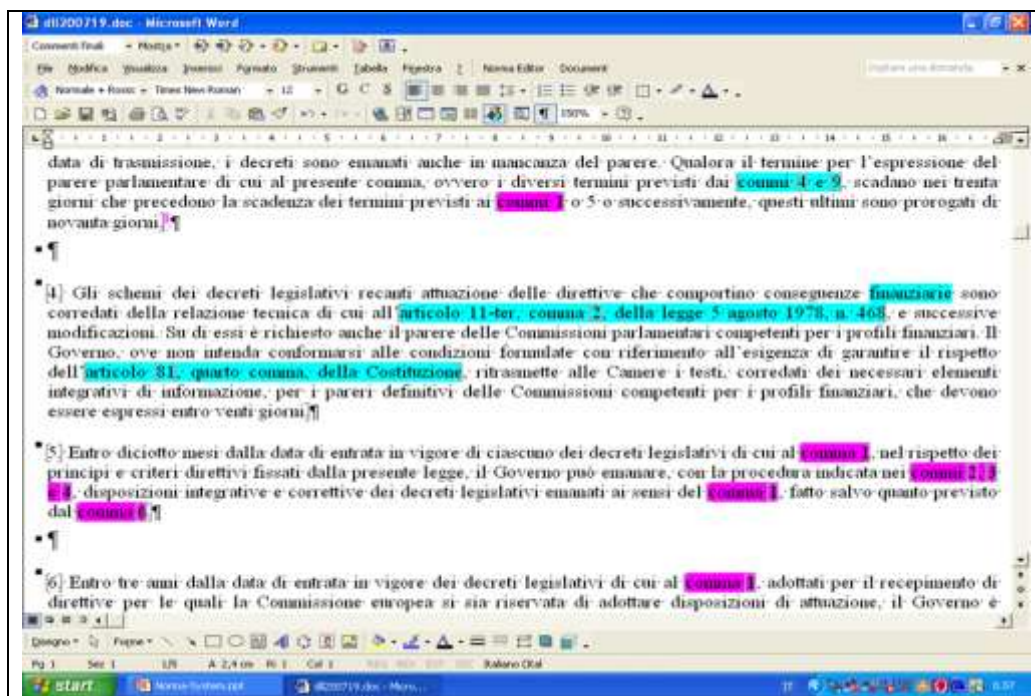


Figure 43 – Automatic recognition of normative references.

The parser also recognizes the normative references based on recurrent key words (article, statute, decree, etc.) and on the regular structure composition of a reference. Usually a reference is formed by the document type, number and date followed by the item number and the partitions. The parser recognizes the internal and external references and color with different shades to give the user immediate visual information.

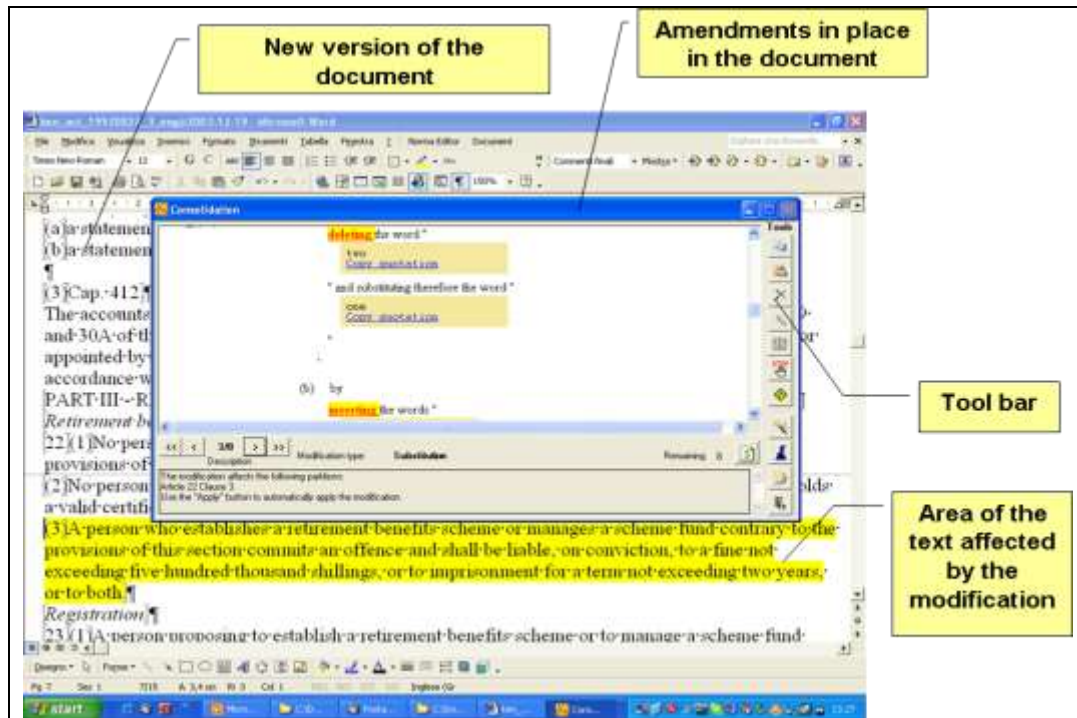


Figure 44 – Example of consolidation on an Italian Senate bill.

The overlaid window in the example above shows the changes brought by the amendments adopted by the parliamentary assembly, while the larger window in the background shows the bill to be updated. The editor, based on XML information obtained earlier in the markup process, automatically suggests substitutions, additions, and exemptions; highlighting in yellow the text in question. The consolidation notes are automatically generated and recorded once they are made by the editor. The basis of this method lies in the traceability of each operation, because XML allows you to annotate all changes, with the ability to reconstruct at any time all that has happened in the document. This method increases transparency, enabling users to directly verify everything that happens in the document and to go through all the steps that have intervened over time.

At the end of each stage in the process—the markup or the consolidation stage—the editor produces a report listing any and all legal-semantic errors (thus guiding users in improving their work), along with a report on technical-errors for its final conversion into XML.

Norma-Editor finally converts the Word document into XML.



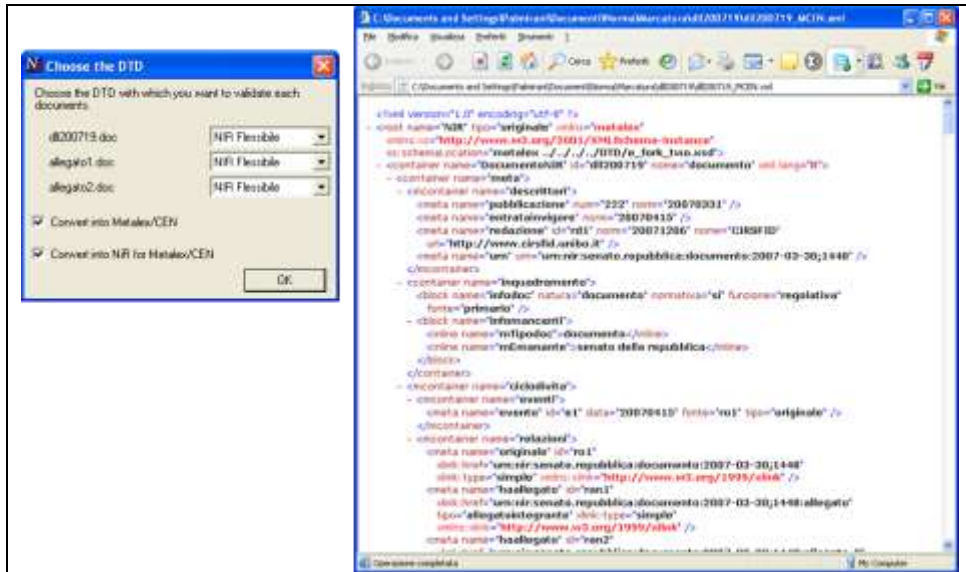


Figure 45 – Conversion into XML using different standards: Akoma Ntoso, NormeInRete, and MetalexCEN.

Norma-editor can also display the results in PDF format, and with a consolidated text it can automatically create a table to compare it with the previous version, using the information already embedded in the XML.

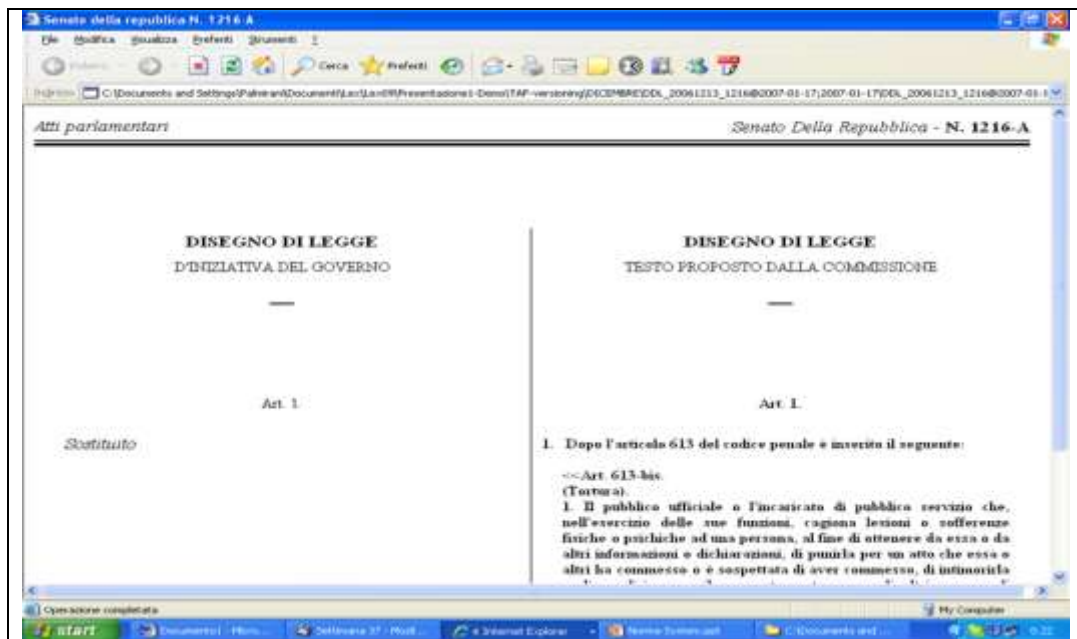


Figure 46 – Display of differences between two versions of a bill from the Italian Senate.

### 8.1.2 Bungeni-Editor

The Bungeni-Editor<sup>24</sup> was developed by the United Nations Department of Economic and Social Affairs (UNDESA) within the frame of the project “Africa i-Parliaments Action Plan”<sup>25</sup>. It is an editor based on Open Office 3.1 and developed in Java 6, thus being multiplatform (running on Mac, Linux, Windows, and other systems).

<sup>24</sup> On the Web at <http://code.google.com/p/bungeni-editor/>. In the Kiswahili, *bungeni* means “inside parliament.”

<sup>25</sup> United Nations Department of Economic and Social Affairs “Africa i-Parliaments Action Plan: Strengthening the Role of African Parliaments in Fostering Democracy and Good Governance through Knowledge and Information Management”.

Bungeni-Editor belongs in the class of editors based on the processing of texts: in this case we can use all the tools offered by the Open Office suite.

Bungeni-Editor makes it possible to mark up parliamentary debates, judgments, and bills in XML.

It does not have a parser for the automatic recognition of the document's structure, references, and metadata, but it is coordinated with a database that contains lots of useful information with which to automatically complete the markup of parliamentary documents, such as the list of MPs, their roles, their institutional affiliations, and the various stages of the legislative process.

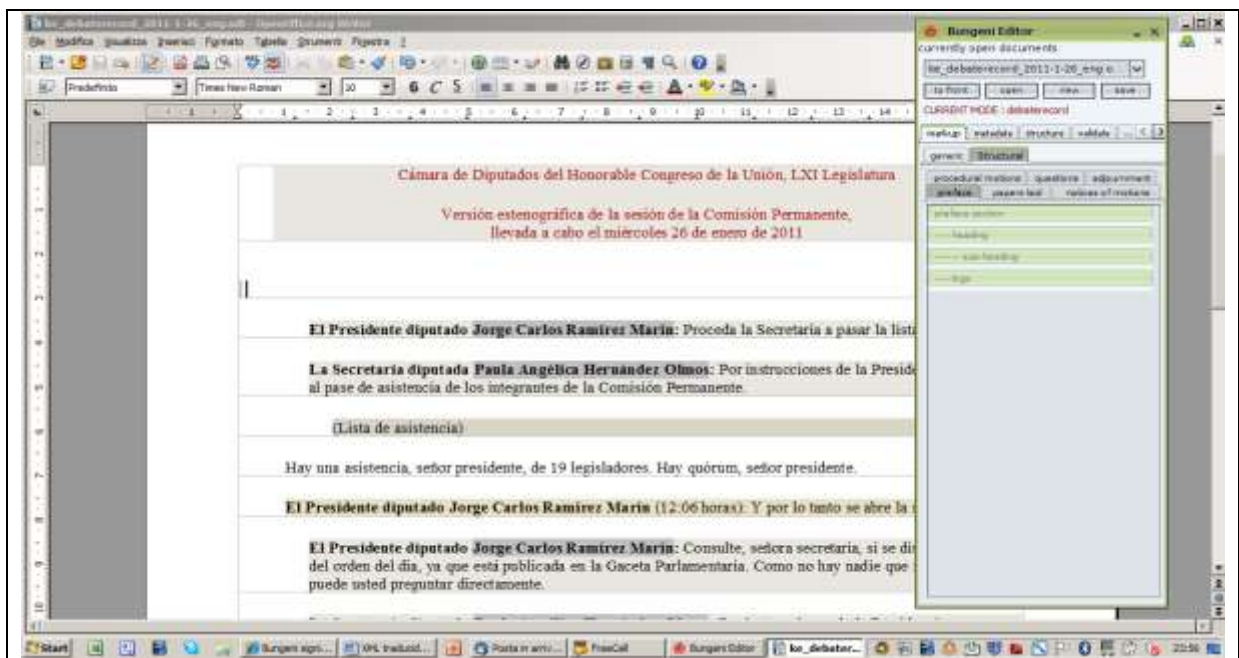


Figure 47 – Example of a test transcript of Mexico's Chamber of Deputies.

Bungeni-Editor converts the result of the manual markup into XML and PDF.

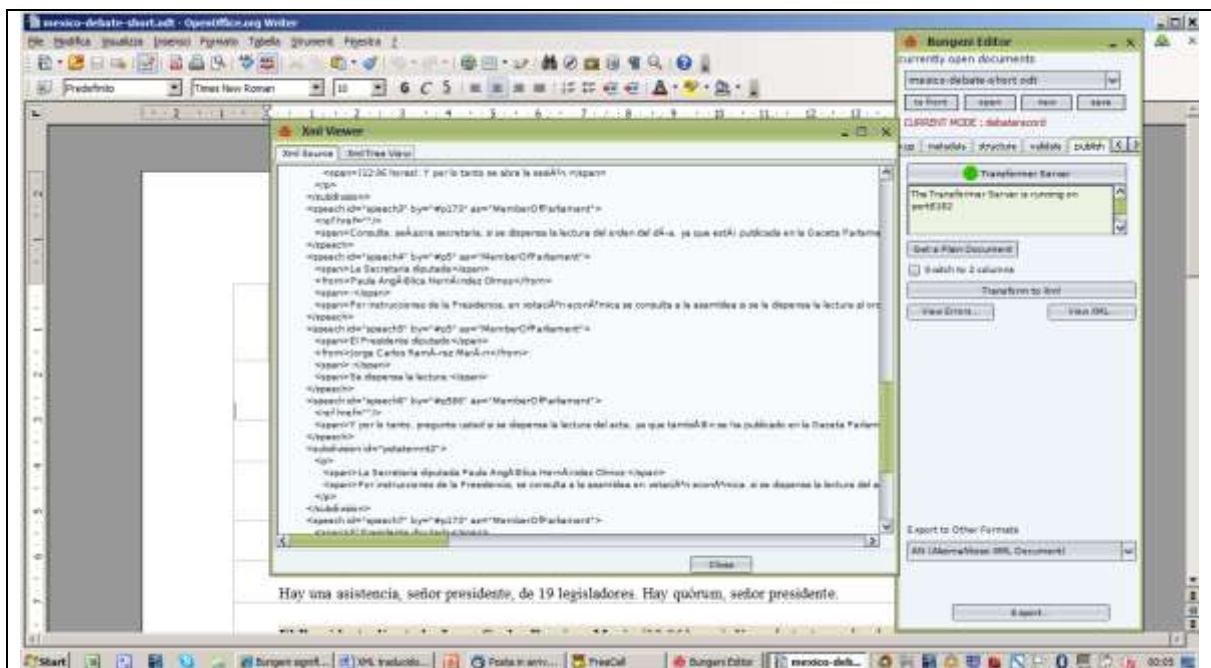


Figure 48 – Conversion into XML.

At the intermediate stages, the editor produces a report of errors and warnings to guide the user through the correct markup.

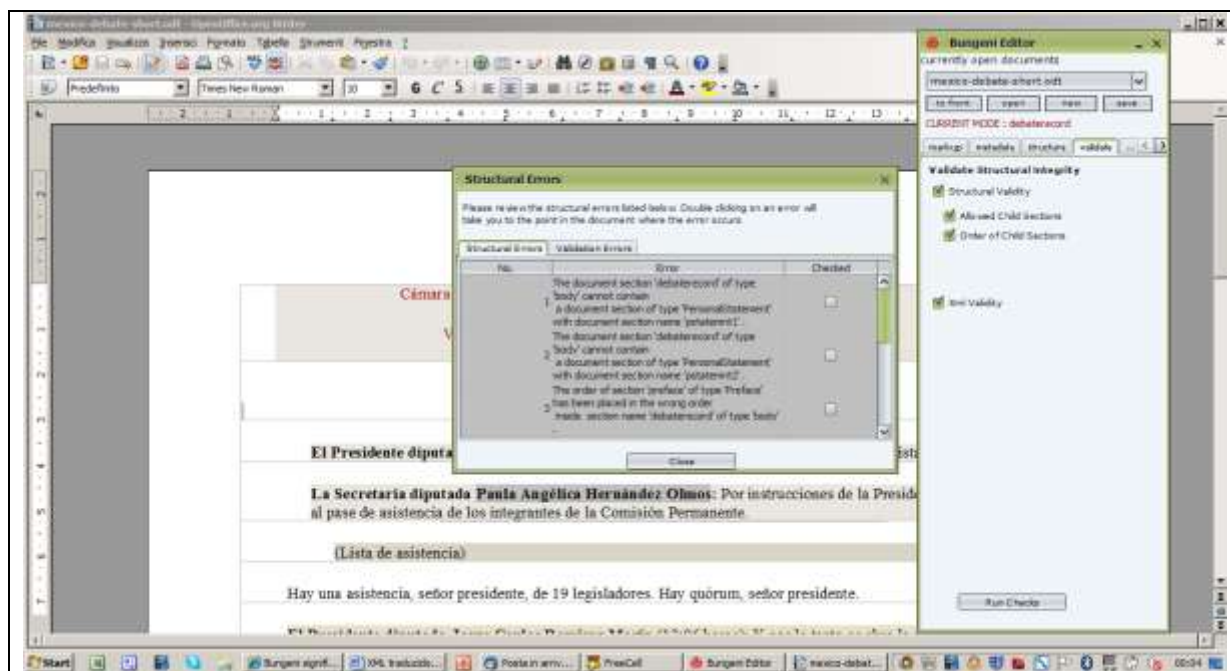


Figure 49 – Report pointing out incorrect markup

## 8.2 Native XML Editors

In a native XML editor, anything that is typed into the document will be checked as you go along, meaning that as the user types, the editor will check to see whether the document is compliant with the XML standard adopted. This can be an advantage in all situations involving simple documents with clear rules and no exceptions. Otherwise, the strictures imposed by the XML syntax will deprive the editor of the flexibility the author needs to linguistically and structurally express content.

### 8.2.1 xmLeges

The XMLLeges editor was developed by the ITTIG-CNR in Italy in 2003 with the primary objective of guiding the user through the stages of legal drafting rather than through the markup of existing documents. The editor, based on a native XML, is equipped with a series of networks that guide the user in the composition of the text. It is developed only for the Italian standard NIR.

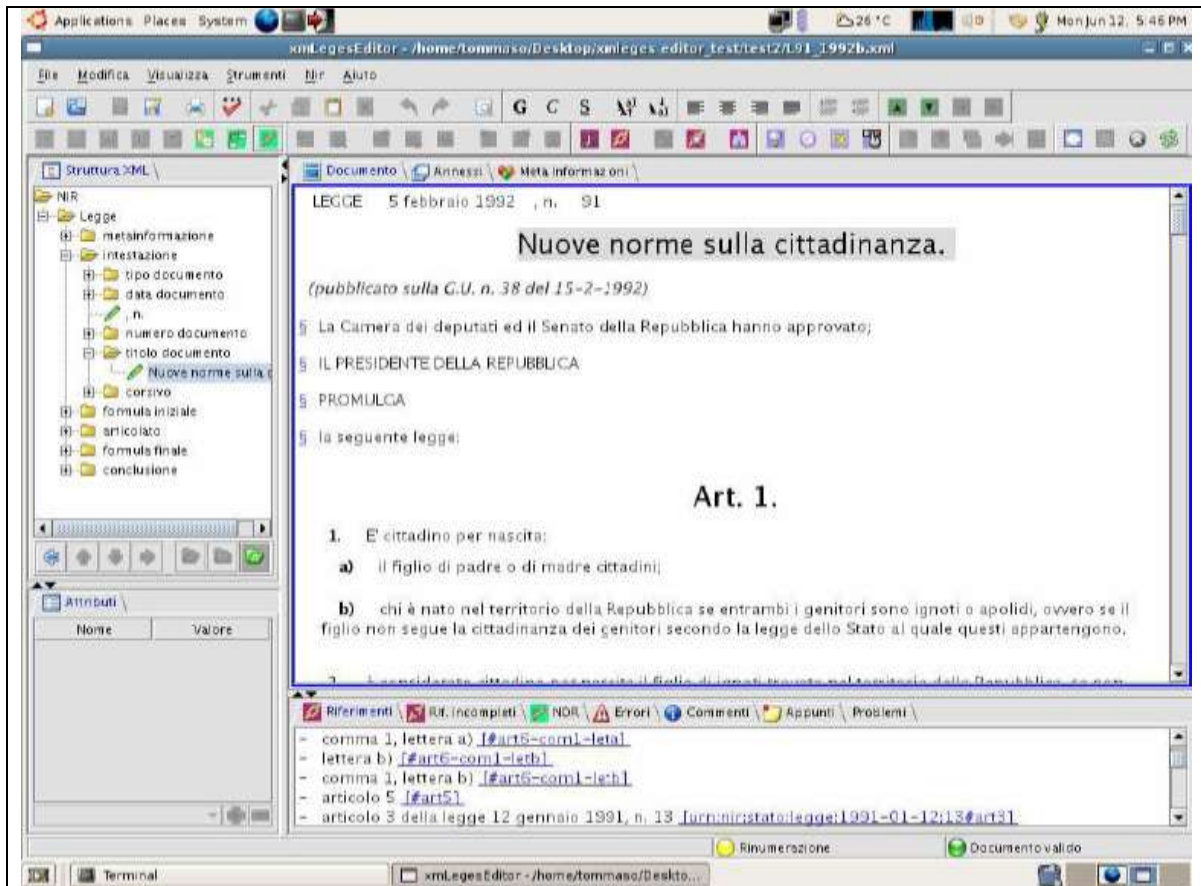


Figure 50 – Editor xmLeges.

This editor is very effective in Italian legal texts but the interface is not available in other languages.

## 8.2.2 LegisPro

The editor, Xcential LegisPro, is a highly customized version of the XMetaL editor. It is currently deployed in the state of California and has been deployed for six years. It is a native XML editor that provides a quasi-WYSIWYG<sup>26</sup> editing environment suitable for attorneys and other non-technical staff to draft and amend legislation. In particular, it provides context sensitive commands and a drag and drop environment for treating components of legislation as building blocks in drafting new legislation. Underlying LegisPro is a Legislative XML schema. The editor can be adapted to various legislative schemas such as Akoma Ntoso by way of configuration - supplying the schema, basic templates, and a set of XML-based configuration files which define appropriate behavior in various contexts. The editor can interface with XML repositories, relational databases, or even the simple file system using a simple seven function SOAP<sup>27</sup> interface plus a basic RESTful interface which are both easily adapted.

<sup>26</sup> What you see is what you get – WYSIWYG.

<sup>27</sup> SOAP: Simple Object Access Protocol. [http://www.w3schools.com/soap/soap\\_intro.asp](http://www.w3schools.com/soap/soap_intro.asp)

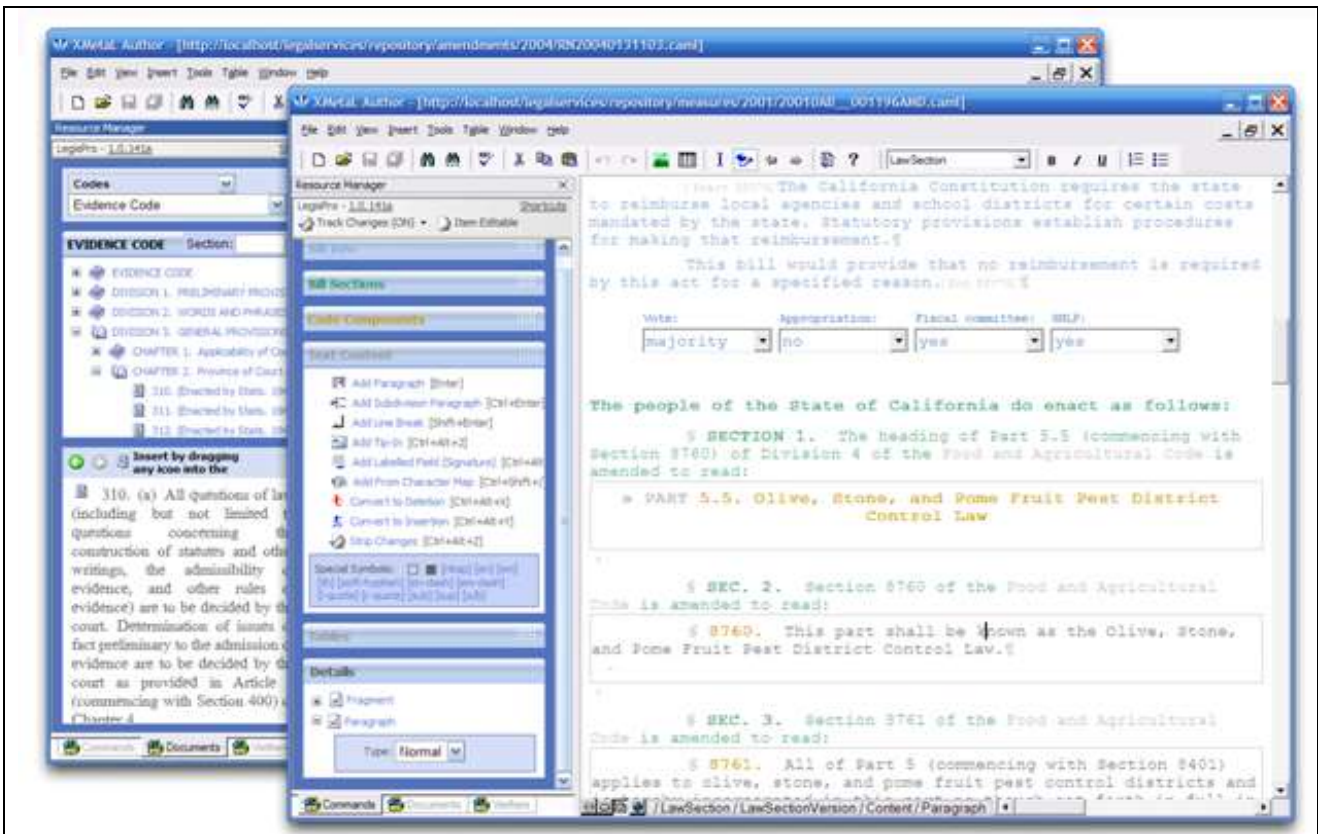


Figure 51 – Example of bill in the State of California.

### 8.3 Web Editor

There are text editors that work through the Web, i.e., they use the browser to activate the functions of a normal text editor. We see these applications whenever we visit Web pages, emails or GoogleDoc. As we have mentioned, these applications are limited in their graphics capabilities and provide tools for interaction with the base user as HTTP protocol, which governs the use of Web pages, does not allow activate working sessions during long periods of time and consist of complex sequences operations. The interfaces are still very immature and incomplete compared to Office Word or Open Office.

Secondly, we have the problem of not being able to work in the file when we are off-line. In these cases it is necessary to install a true and own network in your own laptop. Finally, the synchronization of the work done off-line in contrast with what has been done by others in the network is complicated and does not guarantee a reliable traceability of all operations. The traceability of operations, however, is a key point of these editors that must register the actions linked to precise stages of the legislative process.

For this reason, these editors are used to achieve specific objectives and are coded by very precise rules. The European Parliament has had success using this technique by applying AT4AM<sup>28</sup>.

Using a browser the proposal of the commission already in XML Akoma Ntoso format can be displayed. Each Member of Parliament may always amend the text by using the browser.

<sup>28</sup> AT4AM: authoring tool for amendment. Presented at the World e-Parliament Conference in 2009.

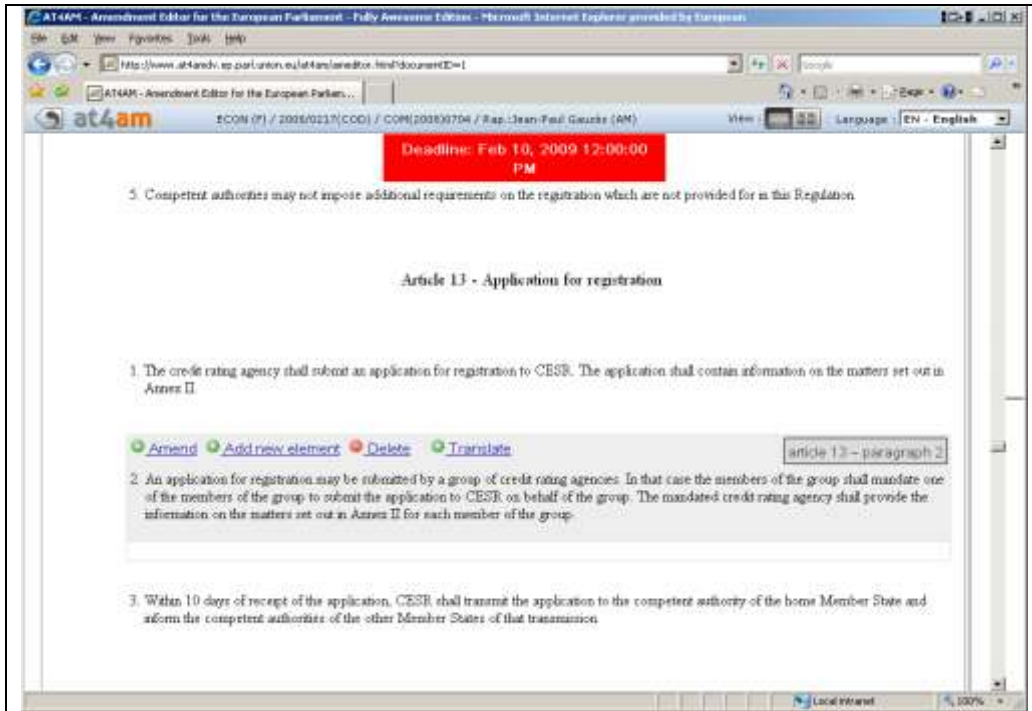


Figure 52 – Example of amendment by AT4AM.

From the modification performed we can automatically see the text of the amendment which has been compiled and proposed to parliament for final approval.

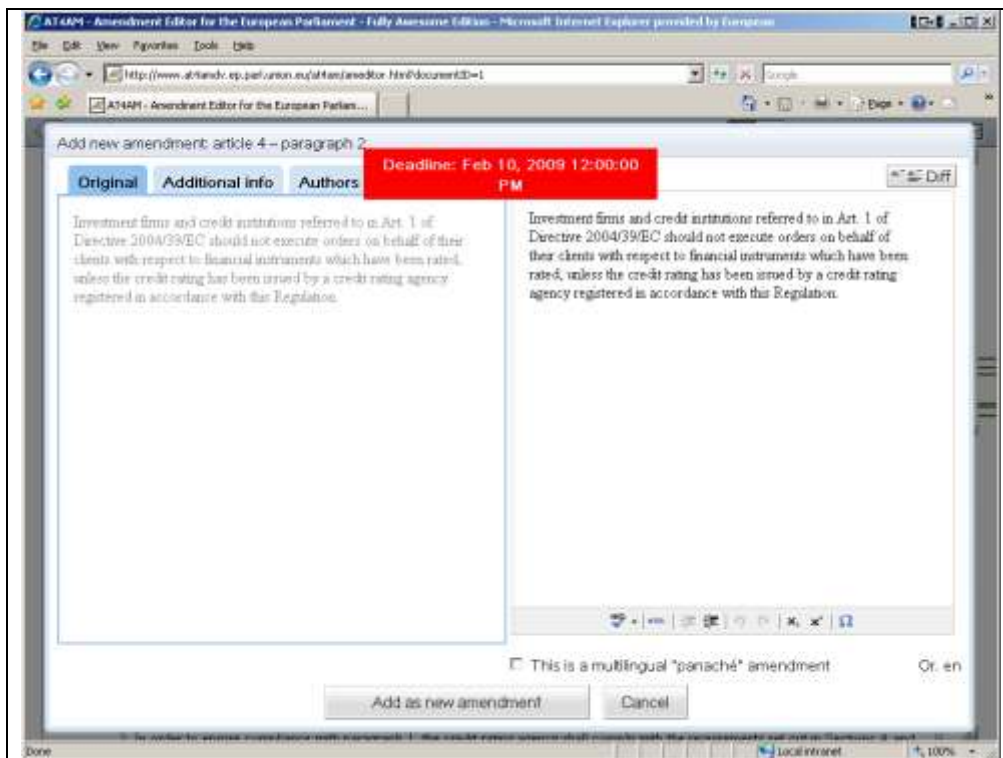


Figure 53 – Example of amendment.

Therefore, the amendments are automatically converted into XML and are grouped in the assembly reports.

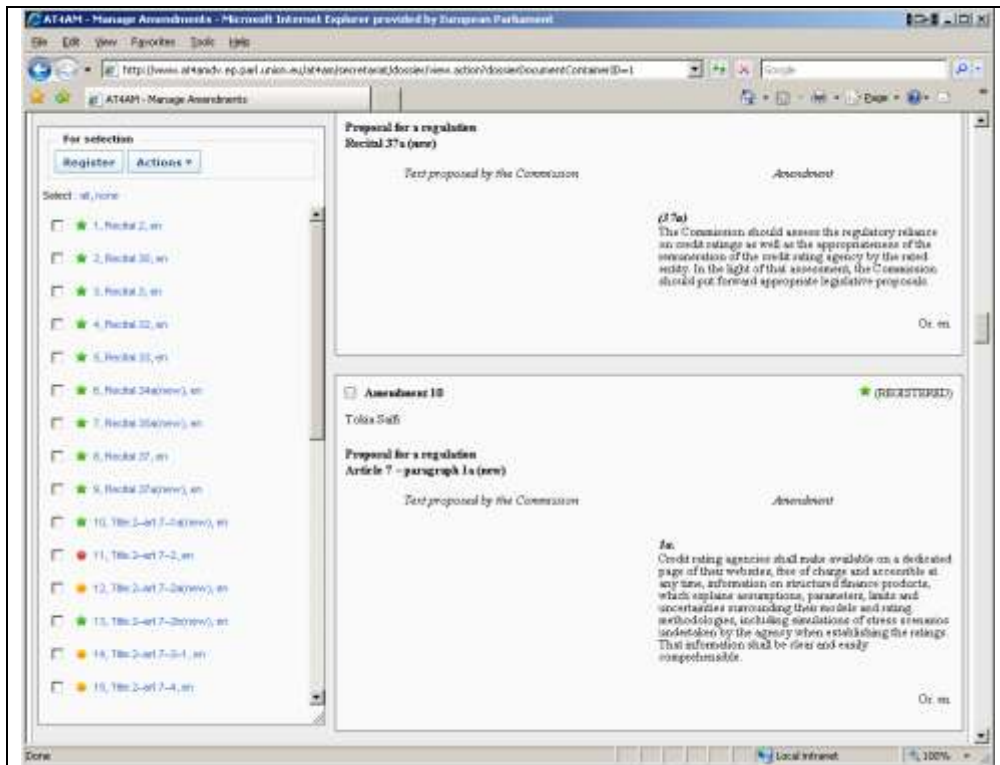


Figure 54 – Aggregation and management of amendments to the report for assembly

Currently, 70% of the European Parliament's amendments are submitted by Members of Parliament (MPs) with this tool.

## 9. Database Management Systems for Legislative XML Documents

### 9.1 *Norma-System*

Norma-System is an information system integrated with Norma-Editor to archive, search and display normative texts markup in XML. The role of Norma-System is also to govern the whole life cycle of a bill and the laws passed. Its purpose is to manage the control of different versions of the document and facilitate the appropriate consolidation of legal texts. The consolidation is in fact an operation marked by the amending events that occur in the system of rules, and often these events have unexpected dynamics: we find the changes to be implemented in the future, changes that must be applied in the past (retroactive changes) or rules that for any reason should be muted or suspended for a time, whether definite or indefinite. Thus, there is overlapping of normative references, which creates a complex web of cases that determines the order in which amendments should be applied to the original legislative text.

Norma-System has internally developed a temporal model that keeps track of all these events and guides the user through the consolidation taking into account such events.

The Italian Senate has adopted Norma-System in the regulations of the camera, to keep it updated over time and provide users (mostly internal staff to the Senate) a vision point-in-time, i.e. instantly, of the evolution of the regulation over time. Also, the CED (Electronic Documentation Centre) of the Italian Supreme Court of Cassation has adopted Norma-System together with Norma-Editor to markup in XML all the rules published in the Official Gazette and to provide a refined tool for judges to update norms, enriched with notes and classifieds for text search.



Figure 55 – Example of the use of Norma-System by the Italian Court of Cassation



Figure 56 – Example of the use of Norma-System by the Italian Senate.

A similar prototype portal has been developed to accommodate the documents markup in Akoma Ntoso and Metalex/CEN.

## 9.2 Bungeni

Bungeni is an integrated computer system developed by UNDESA in the frame of the project “Africa i-Parliaments Action Plan: Strengthening the Role of African Parliaments in Fostering Democracy and Good Governance through Knowledge and Information Management”.

Bungeni comprises three different modules:



- an information system that manages the parliament's legislative process workflow according to the different legal traditions;
- a Content Management System based on Plone open source platform for storing the document and modeling the workflow. Bungeni belongs also to the Plone eGov community (<http://www.plonegov.org/articles/bungeni>);
- an interface layer for content distribution.

Bungeni aims to manage the flow of parliamentary procedure and to produce XML documents involved in Akoma Ntoso, thus benefitting from the profits produced by XML. All the events that regulate the legislative process are managed by Bungeni that is connected itself with Bungeni-Editor for acquiring the document marked up in Akoma Ntoso. Bungeni uses the XML information for improving the interlinking functionalities among the minutes, bill, act, Hansard, order of day, amendments, etc. It permits to reuse the information and to coordinate them from minimizing errors during the data entry. Moreover, Bungeni is able to suggest to the clerk the correct order of the documents according to each step of the legislative process.

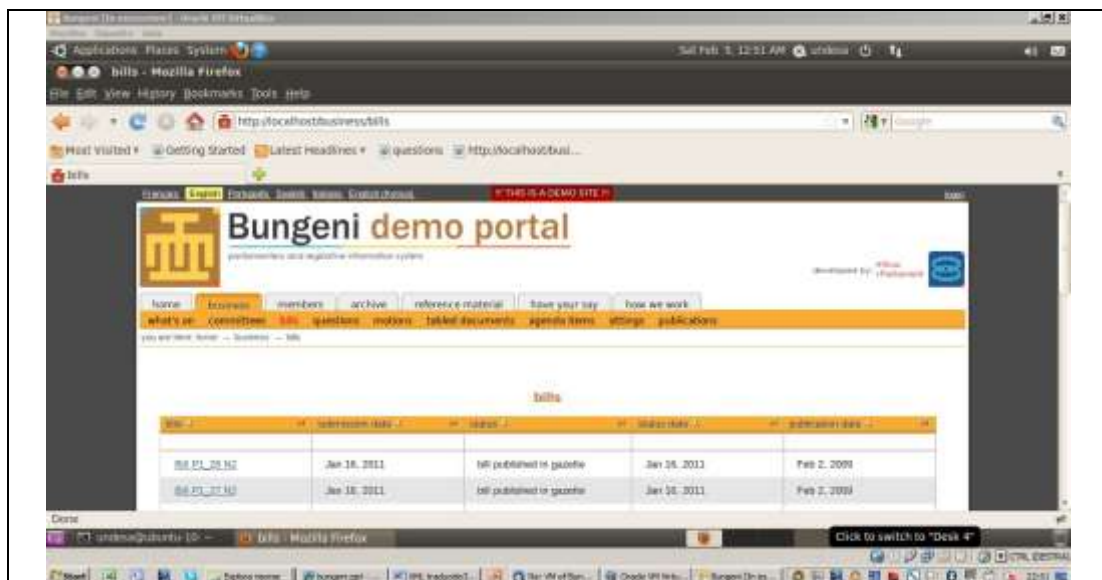


Figure 57 – Integrated management of all phases of the parliamentary procedure.

Bungeni manages the dynamic creation of quotes, written requests, parliamentary questions, the automatic creation of the agenda and the convening of the session.

It helps the secretary general of the assembly to organize and add the necessary documents for the session.

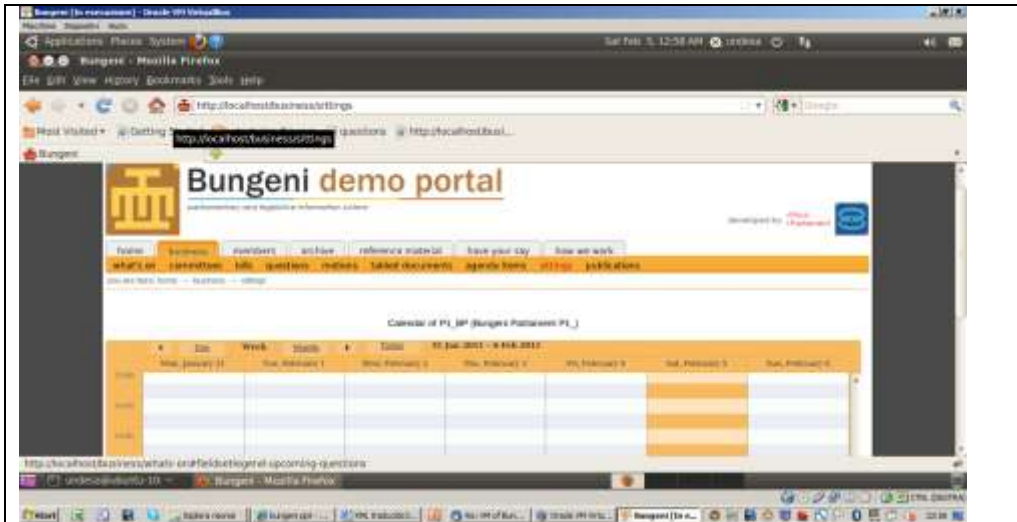


Figure 58 – Predisposition online of the session.

It is an interactive console to facilitate the work of the secretary general and of the chairman of the meeting.

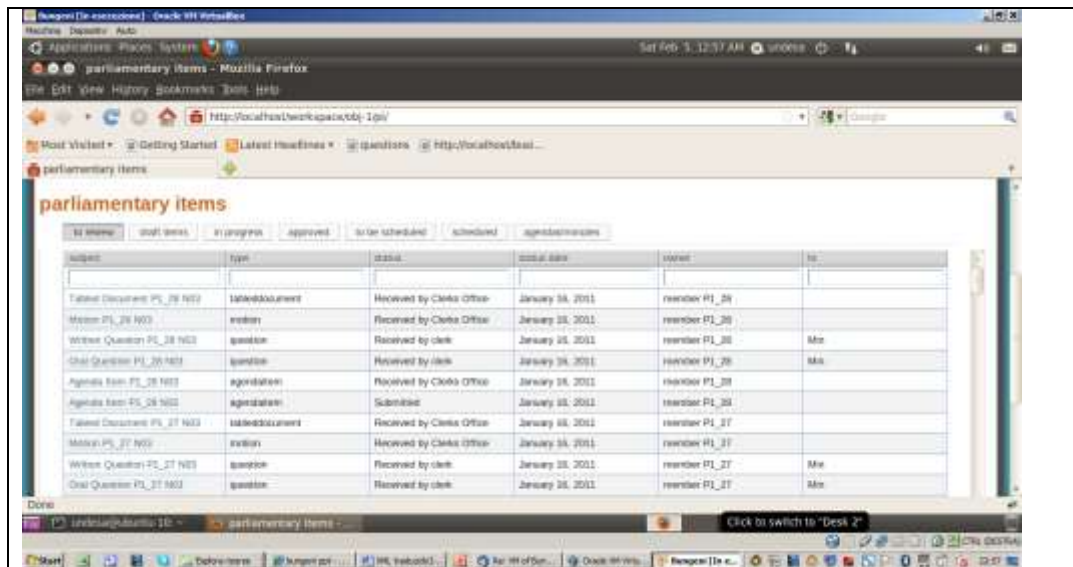


Figure 59 – Document management to include in the agenda.

## 10. Link Solver

An important component of the documentary projects in XML format is to create a service that governs the direction of the normative references. In other words, it is necessary to have a Web service that is capable, having a URI, to arrive at the correct file stored on a server. If in fact we adopt the expressive structure of the URI of Akoma Ntoso, a reference to a section of the law will be expressed as <http://sv.ley/2011-01-10/23/main # art34>. This link is not really a pointer to a physical resource (a file on a server), but a logic description of the immutable resources over time. There is, therefore, software named URI solver that allow the physical file to be reached (URL).



Figure 60 – Use of the solver schema.

All countries that faced the transition into XML had to create this centralized solver for a stable authority (government, agency for technology, parliament, etc.). The solver service is a software available through the Web and consists of a catalogue, that contains all of the digital resources of legislative documents and a conversion table that combines the logical name to different physical names of the resources in the network. The catalogue is a table of indexes and does not contain digital resources; instead they are directed to the file<sup>29</sup>.

Each time a user requests access to a certain law, XML will provide the logical name (URI) and the solver will go to the catalogue to take the name or physical names together with the exact location of where they are. The advantage of this mechanism is that if a server suddenly removes all its databases, the links used by the URI will continue browsing, which will be enough to change the central catalogue automatically, instead of changing all XML documents manually.

Another advantage of the solver is presented when the network must find different versions of the same document. The solver, given the name of the resource base (work) can draw all versions (expression). Therefore, if you need the document of the law updated to 2006, the solver will return the exact URL, i.e. the version in force at the time required.

The solvers can be created in three ways: a) as an extension of a resource management method managed by a DBMS or database, b) as a Web application that intercepts all links and redirects them to that page; c) if the URI-URL syntax is used by modifying the phase of the Web server direction (Apache version), so that the browser automatically route without using an intermediate software layer.

Within the scope of the project Akoma Ntoso, the department of computer science has developed this last method by providing a service whereby typing the URI into the browser, the Web server automatically includes all components of the logical name and attempts to create the corresponding URL.

<sup>29</sup><http://www.akomantoso.org/release-notes/akoma-ntoso-1.0-schema/naming-conventions-1/bungenihelpcenterreferencemanualpage.2008-01-09.1161996559>.

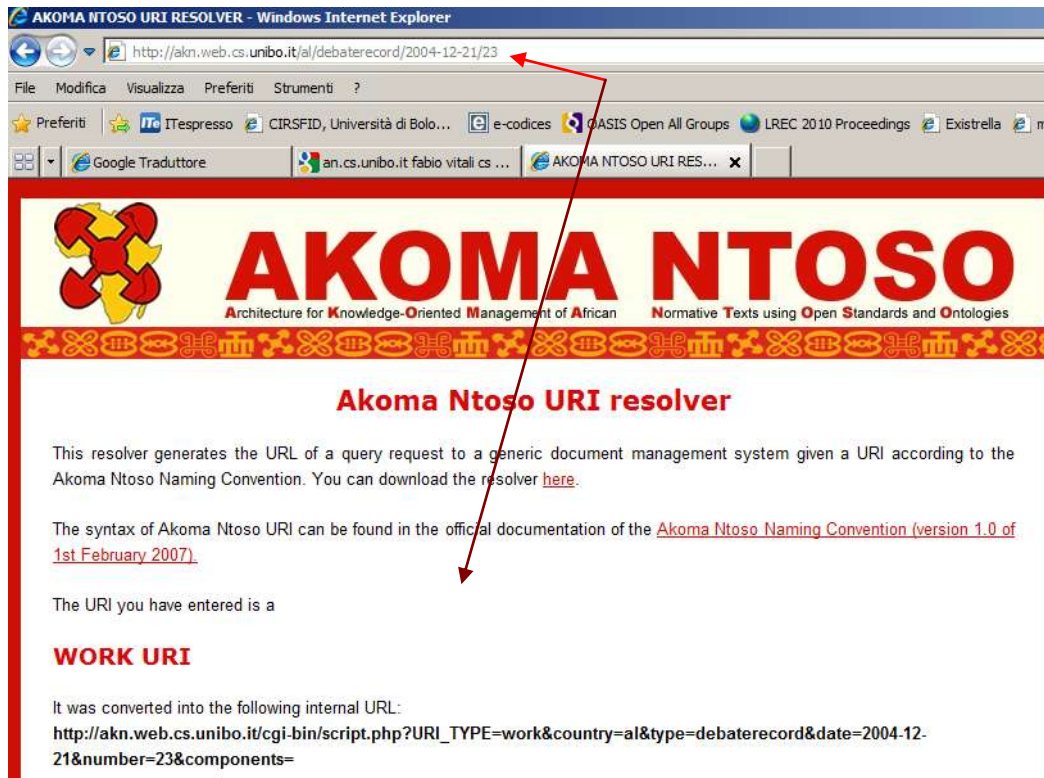


Figure 61 – Example of directing from URI to URL with a solver that uses directly the browser HTTP protocol.

# PART IV

## Markup Methodology in Legislative XML

### 11. Legal Analysis of the Document

Prior to proceeding with XML markup, the legal expert conducts a legal analysis of the document as the first and fundamental step of the entire markup process.

By legal analysis we mean to analyze the text by grasping all of the legal meaning of the document, usually on the paper, and to then proceed with the markup. It consists of following 8 steps.

#### 11.1 *Distinguish the Type of Document*

The definition of the type of document is a fundamental task to effectively conduct the markup. The choice should be made based on the type of structure: hierarchical structure (act, bill, judgment), or non hierarchical structure (report, doc, debate). The type of the document determines the metadata (e.g. voting session for the debate), the subdivision of the document structure (e.g. article for the act and bill; speech for the debate), and the internal semantic organization of the document (e.g. cover for the bill; annexes; collection document). On the base of the type of the document we can detail the mark-up for describing the meaning of each textual component (e.g. in the bill we have the “proponent” and the “cover”, that in the act are not included).

#### 11.2 *Distinguish the Parts of the Document*

In case it is a file coming from the Official Gazette, there is plenty of information coming from the publishing process such as footnotes, page numbers, table of content, logos, etc. In this regard, the first thing is to separate the parts that are subject to be included in the markup (content) from those that should be cancelled prior to the markup because they are part of the publication process.

The following example is the cover of a bill from Panama that is composed by different semantic elements: content, metadata and graphic logos. It is important to semantically distinguish them before to start the mark-up process. If the legal expert confuses the metadata (e.g. classification of the library) with the content (text approved by the assembly), the XML file will not represent the correct legislative process.

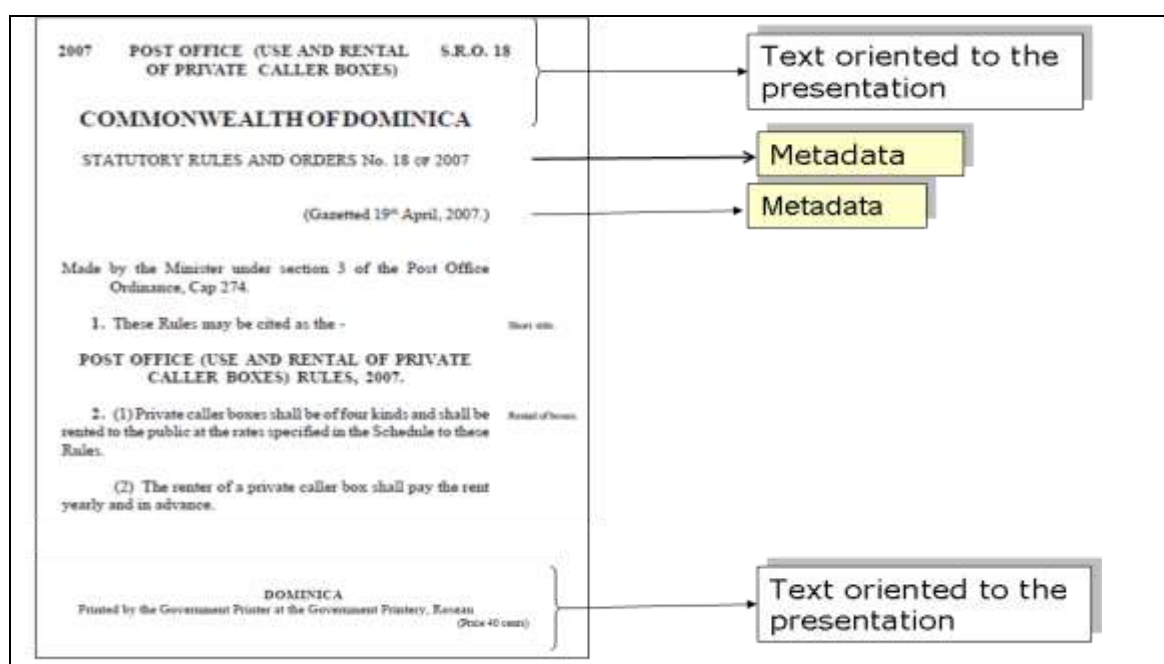


Figure 62 – Analysis of the content, metadata, presentation blocks.

Before beginning the markup process, it is important to analyze the structure of the document and its semantic components. Only a legal expert can distinguish the semantic of each part of a document composed by different components in order to assign to each sub-document the correct role in the collection.

In the following example, the folder containing the bill is composed by different types of documents:

- a. Statement of purpose
- b. Draft bill
- c. Adoption letter / Opinion
- d. Bill
- e. First debate report
- f. Bill passed
- g. Law in Gazette

The important first step is to analyze the temporal sequence of the document and the relationship of hierarchy between them (i.e. annexes).

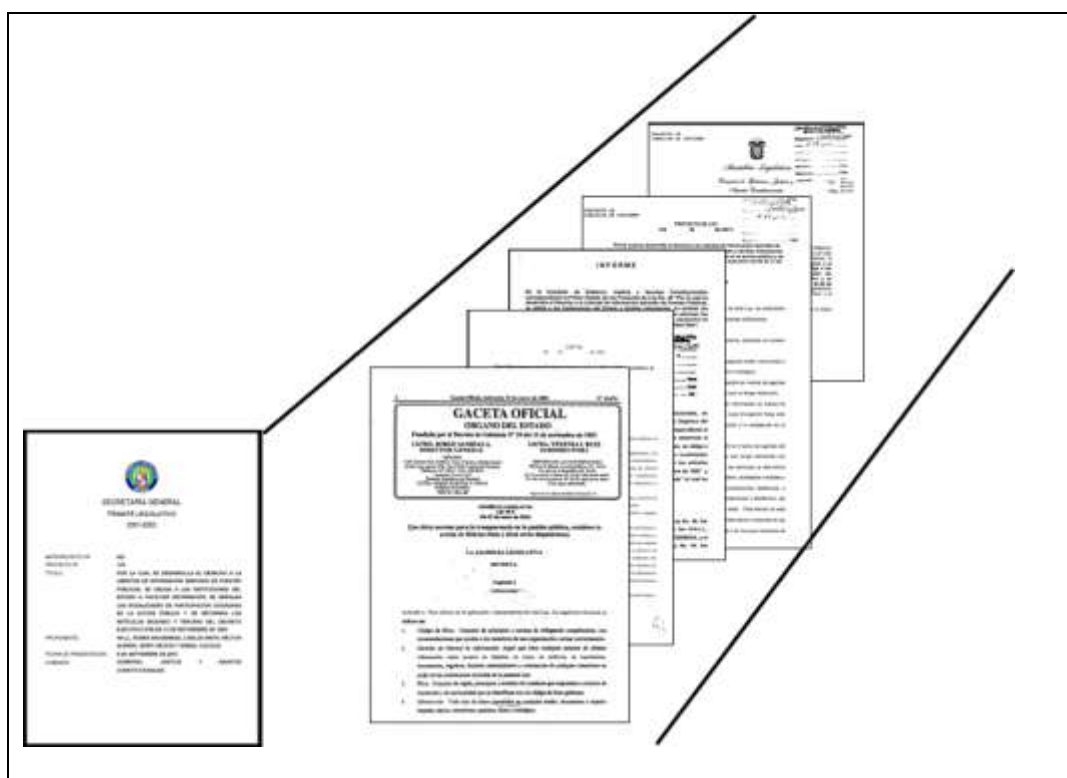


Figure 63 – Bill folder.

### 11.3 *Distinguish the Identifying Elements of the Document*

Each document has to be given a name according to the nomenclature chosen by the parliament's information service. We suggest adopting the nomenclature based on FRBR above mentioned. In any case, the important thing is to give each document a logical name so that we refer to digital resources over time, regardless of their actual physical location (server name).

In fact, to name legal digital resources allows referencing them in a stable, permanent way and using characteristic information of the document. To reference documents in a permanent way is also called permanent URL, often used by the digital library services. Akoma Ntoso uses the permanent URI method using the technical specifications of URLs, meanwhile other authors prefer the URN (Uniform Resource Name). The links expressed by the URN technique do not use the standard syntax of the W3C (URL) and therefore lose the intrinsic ability of the browser (e.g. Internet Explorer, Firefox, Opera, Chrome, etc.) to automatically point to the cited documents. Therefore, the URN-based systems necessarily need a conversion software. See URN:LEX initiative (<http://tools.ietf.org/html/draft-spinosa-urn-lex-02>) initiated by the ITTIG-CNR, Florence, and used by LexXML Brazil (<http://projeto.lexml.gov.br/documentacao/Parte-2-LexML-URN.pdf>) to convert the URN into URL. Meanwhile, the permanent URI technique can work even without the solver and the links can be browsed locally (e.g. on a CD-ROM) without having to install additional software.

#### 11.4 ***Distinguish the Document Version***

The phenomenon of versioning occurs when a document goes through many changes over time and thus many versions of the same document are created (many *expressions* of the same *work*).

To keep track of the correct sequence of versioned documents in time is an extremely important function for normative documents.

In Akoma Ntoso there are various ways to capture this phenomenon in an XML file.

First, by the URI, adding after @ the date of the version. The following fragment is brought from the meta block, particularly each version creates a new *expression*.

```
<FRBRExpression>  
  <FRBRthis value="/sv/decreto/1993-07-15/604/esp@2006-01-20/main"/>  
  <FRBRuri value="/sv/decreto/1993-07-15/604/esp@2006-01-20"/>  
  <FRBRdate date="2011-01-10" name="Expression"/>  
  <FRBRauthor href="#palmirani" as="#editor"/>  
</FRBRExpression>
```

Figure 64 – Expression example

Another way of stating that the XML document is the result of a version is using the attribute contained in the sub-root element. This attribute can only have three values: *originalVersion*, *singleVersion*, and *multipleVersion*.

```
<act contains="singleVersion">
```

*OriginalVersion* means it is an original document, *singleVersion* that the document only contains one version of the original document, and *multipleVersion* means that the document can contain more than one version. Akoma Ntoso actually allows multiple versions of the same document to be stored within the same XML file. This mechanism is particularly interesting in the case of multiple amendments or bills that are subject to numerous changes before reaching the assembly.

#### 11.5 ***Isolate each main Legal Block in the Document***

The main legal blocks are the front matter, the body, the conclusions, the tables, and each of the main parts relevant to interpret the structure of a document in a correct and legal way.

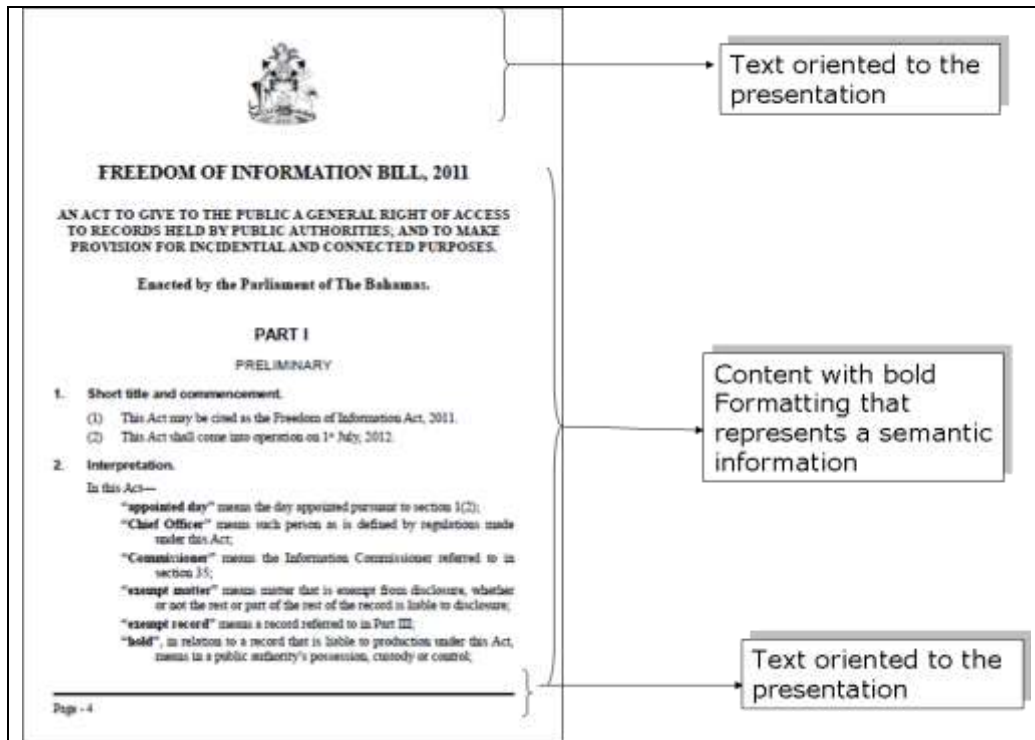


Figure 65 - Identification of the main blocks and distinction with the elements of presentation.

The normative content should be isolated from all the graphic elements used to represent the shape of the document. These, actually, are added by converting XML into XHTML through XSLT, i.e., a style sheet that will govern the visible conversion of XML. Thus, the content may also be represented in different media: Web, Web TV, Smartphone, PC table, etc.

All graphic elements that can be calculated by the style sheet are isolated and treated separately depending largely on the display means. This method will also help to create Web sites accessible to people with disabilities since the content is released from the form and will take the graphic design that best suits the end-user needs.

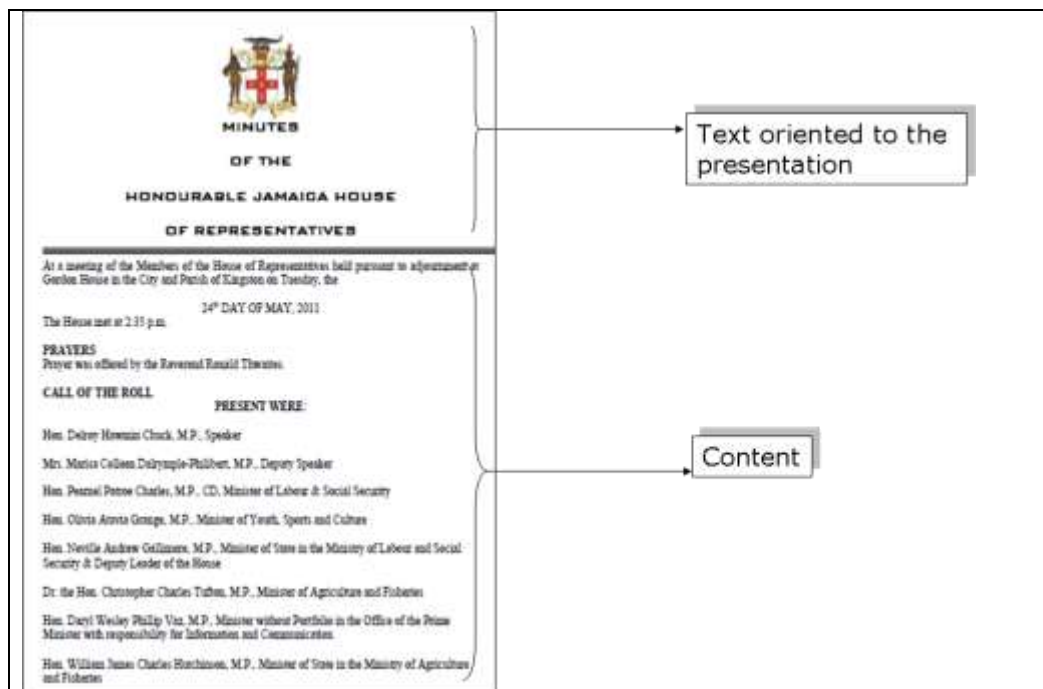


Figure 66 – Identification of the main blocks and distinction from the presentation elements.



It is also important to separate the annexes from the main body; to assign to them form and name; and to handle any eventual multimedia content such as maps, images, tables or diagrams.

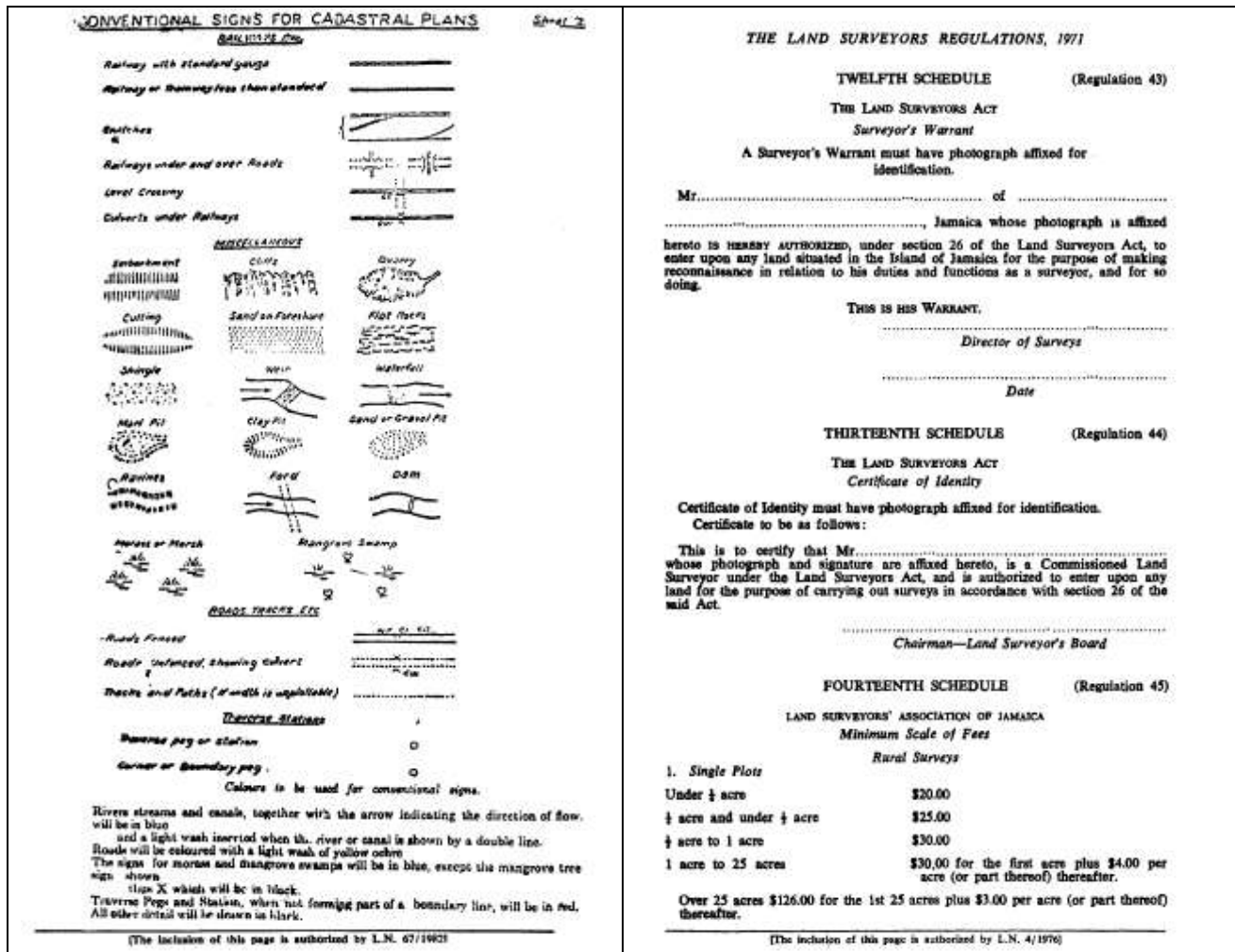


Figure 67 – Annex to a Jamaican Land Act.

## 12. How to Markup the Legislative Documents Structure in XML

Using an XML schema does not guarantee a correct identification of the structure of a legislative document. We can, for example, markup a paragraph as a title and to render the document perfectly valid, even if the paragraph does not represent in any way the title of the document.

There is, therefore, apart from the syntactic correction with respect to the XML schema, also a semantic correction that only legal experts can ensure with their intellectual work.

In fact, only legal experts can assign a tag to a fragment of text knowing the meaning that is attributed to that particular part of the document.

Without legal competence no editor can properly markup the semantics contained in the document itself.

This means that before tagging, regardless of the tool used, a documentary analysis of the text must be undertaken to understand which parts are relevant and which are not.

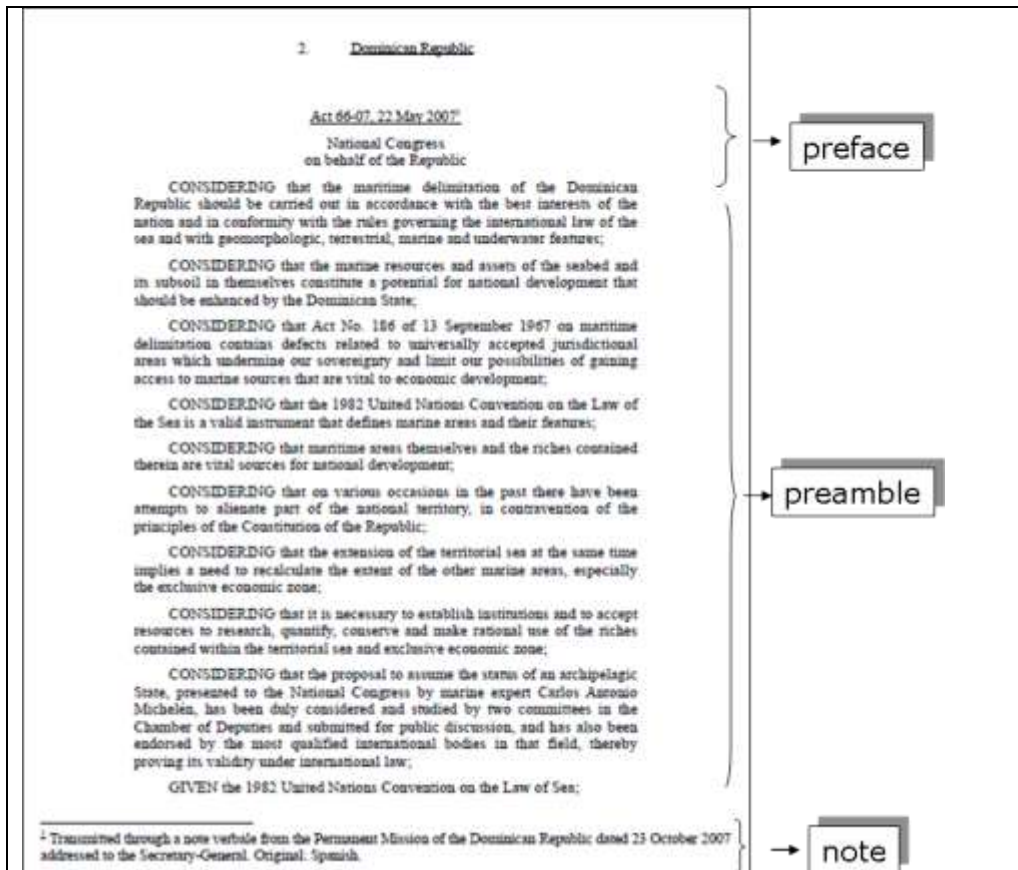


Figure 68 – Legal analysis of the document.

### 12.1 Distinguish the Preface of the Document

The header (preface) of the legislative document (for example, the bill) should be identified and carefully analyzed in order to recognize the sub-elements such as the type of document, date, identifying elements (number), title and proposer.

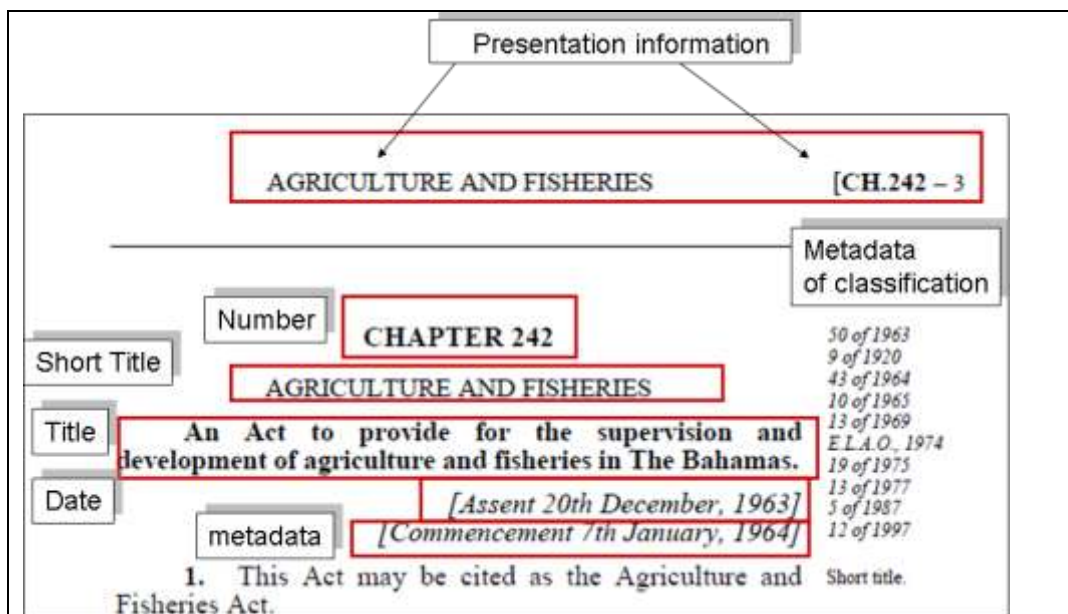


Figure 69 – Preface sub-elements analysis.

The following XML fragment shows the results of analytical work and the careful capture of the legal information contained in the text, as well as the separation of metadata. It is noted in fact that information concerning the publication is not found in this section, and instead will be included in the metadata block.

```

<preface>
  <subdivision>
    <dotTitle refersTo="shortTitle">Agriculture and Fisheries</docTitle>
    <docNumber>Chapter 242</docNumber>
    <docDate date="1963-12-20">[Assent 20th December 1963]</docDate>
    <docTitle>An act to provide for the supervision and development of agriculture and fisheries in
The Bahamas</docTitle>
  </subdivision>
</preface>

```

Figure 70 – Preface XML fragment.

## 12.2 *Distinguish the Preamble of the Document*

The preamble is the part that explains the motivations that led to adopt a specific legislation. It usually refers to earlier norms and supports and presents considerations. Some legal traditions (as in civil law countries) consider this part of the text as not normative, in others (as in the European Parliament) in turn this part is considered binding and mandatory. All normative references included in this part/block are static, i.e. refer to the very moment in which they are formulated and are included in the speech in support of an argumentative thesis, which can only be based in legal content expressed in that particular moment. If in fact a 1967 document of Dominican Republic is cited to motivate some of the contents of a law, reference to that document should be anchored to the version of the treaty as it was formulated at the precise moment when the writer refers to the norm.

In conclusion, all normative references in XML must be defined as static references.

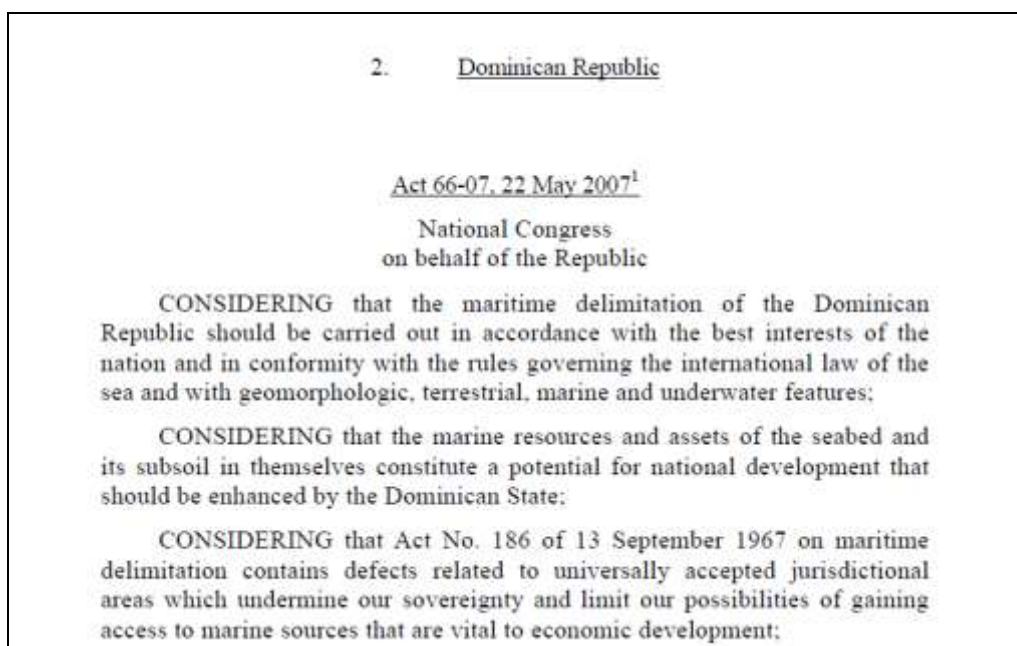


Figure 71 – Preamble legal analysis.

The following XML fragment shows the success of documentary analysis work on the preamble and the use of static references. One can see that the normative reference:

<ref id="ref1" href="/dm/act/1967-09-13/186/main#2007-05-22">

Includes a URL that shows a date at the end that indicates which version of the act should be reviewed as reference. In other words, the act to review is the one in force on the date 22/05/2007.

```

<preamble>
  <subdivision>
    <p>National Congress on behalf of Republic</p>
    <p><span class="indented">CONSIDERING:</span>
    That the maritime delimitation of the Dominican Republic should be ....</p>
    <p><span class="indented">CONSIDERING:</span>
    That the maritime resources and assets .....</p>
    <p><span class="indented">CONSIDERING:</span>
    <p>That <ref id="ref3" href="/dm/act/1967-09-13/186/main#2007-05-22">Act No. 186 of 13
September 1967</ref> on maritime delimitation contains defects.... .</p>
  </subdivision>
</preamble>

```

Figure 72 – Preamble fragment.

### 12.3 *Distinguish the Normative Structure of the Document*

The structure of the text containing the articles is perhaps the most valuable part of an entire legislative document as it represents the real and substantial normative content. It is therefore very important to carefully markup this part of the document. A good, detailed and accurate markup of this part will determine the success of the normative references, of the automatic consolidation and the search by topic. If this part is not properly tagged most of the benefits of XML will be lost.

Therefore, Akoma Ntoso has 17 levels of hierarchy to represent the parts of the articles in a granular, accurate and timely way:

book, volume, part, subpart, title, subtitle, chapter, subchapter, section, subsection, article, clause, sub-clause, paragraph, subparagraph, mark, point.

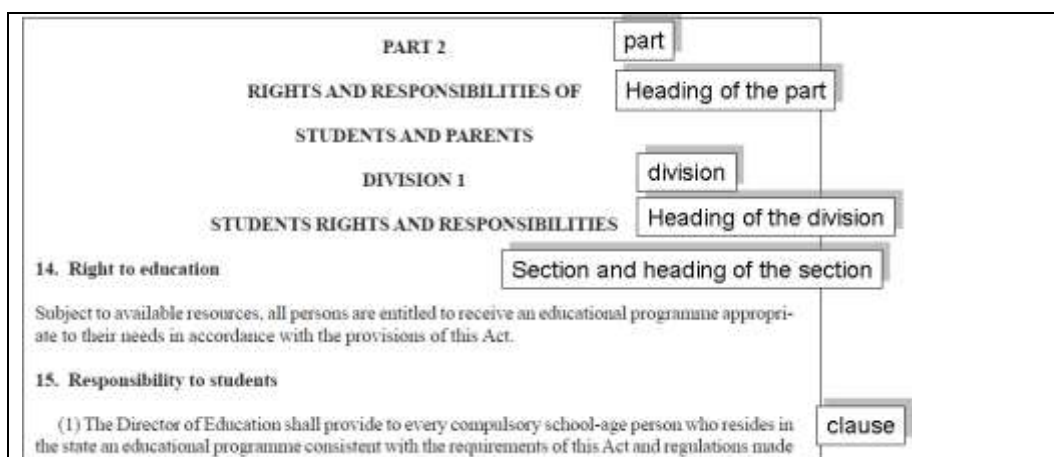


Figure 73 – Legal analysis of the structure.

Each element above mentioned must have a number and can have a heading.

```

<body>
  <part id="prt1">
    <num>Part 2</num>
    <heading> Rights and Responsibilities of Students and Parents </heading>

```

```

<division id="div1">
  <num>Division 1 </num>
  <heading>Students Rights and Responsibilities</heading>
  <section id="sct14">
    <num>14</num>
    <clause id="sct14-cls1">
      <content>
        <p>
          Subject to available resources, all persons are entitled to receive an education programme
          appropriated to their needs in accordance with the provisions of this Act.</p>
        </content>
      </clause>
    </section>
  </division>
</part>

```

Figure 74 – Legal analysis of the body of articles.

## 12.4 *Distinguish the Final part of the Document*

The final part of the following document (Laws of Antigua and Barbuda, The Caribbean Food Corporation Act, Chapter 72) contains very interesting information that may be useful for sophisticated searches, such as: «extract all laws passed by Ministries of Agriculture in 1976 concerning food cooperation and which entered into force between 1980-1990».

```

ARTICLE 40
ACCESSION

After the entry into force of this Agreement, a Country other
than one listed in the Annex may in the discretion of the Board
of Governors be permitted to become a member of the Corpora-
tion by accession to this Agreement on such terms as the Board
of Governors shall by a two-thirds majority vote of the total number
of Governors determine. Any such Country shall deposit, on or
before a date appointed by the Board of Governors an Instru-
ment of Accession with the Depositary who shall notify such deposit
and the dates thereof to the Corporation and the parties to this
Agreement. Upon such deposit, and upon the subscription and
payment for shares issued to it, the Country shall become a member
of the Corporation on the appointed date.

Signed by Garvin Kennard, Minister of Agriculture
For the Government of Guyana on 18th August, 1976 at
Georgetown, Guyana.

Signed by Reg. E. Phillips, High Commissioner
For the Government of Jamaica on 10th September, 1976 at
Georgetown, Guyana.

Signed by
For the Government of Monserrat on
at

Signed by Robert L. Bradshaw, Premier
For the Government of St Kitts-Nevis on 28th August, 1976 at
Basseterre, St. Christopher (St. Kitts).

Signed by Ira D'Auvergne, Minister of Agriculture and Lands
For the Government of St. Lucia on 1st September, 1976 at
Castries, St. Lucia.

Signed by E. Joshua Minister of Agriculture and Trade
For the Government of St. Vincent on 2nd September, 1976 at
Kingstown, St. Vincent, W.I.

```

Figure 75 – Legal analysis of the conclusions.

Therefore, in the conclusions, we markup signatures, signatory's role, place and date.

```

<conclusions>

```

```

    <p>Signed by Garvin Kennard, Minister of Agriculture</p>
    <p>For the Government of Jamaica on <docDate date="1976-09-10">10th Sptember, 1976</docDate>
    at <span class="city"> Georgetown</span>, Guyana. </p>
  </conclusions>

```

Figure 76 – Legal analysis of the conclusions.

## 13. How to Markup Legal Metadata in the Legislative Documents in XML

### 13.1 *Distinguish the Identification Metadata of the Document*

As mentioned before, our model to identify the digital legislative resource is FRBR.

This is due to the fact that over time, different versions of the same document can be created, thus different and equally valid versions can coexist (e.g. contextual amendments of the same article) or may generate different linguistic translations. All these expressions of the same abstract concept (law) are called *expression*.

For each version we can have different formats: XML markup in Akoma Ntoso, XML markup according to LexML Brazil, PDF, XHTML, etc. All these formats are the *manifestation*.

Thus, multiple copies of a file, distributed in different PCs, servers and networks can coexist. These files are called *item*.

So we can model the relationship between these objects and say:

- a job (work) is related to many different expressions
- an expression creates many manifestations
- a manifestation is multiplied on many items.

All of these objects, however, must be referred to the unique and unmistakable legal source that is the judicial legislation resource. To do that metadata are inserted into these relationships:

<pre> &lt;identification source="#bungeni"&gt;   &lt;FRBRWork&gt;     &lt;FRBRthis value="/sv/decree/2005-12-14/912/main"/&gt;     &lt;FRBRuri value="/sv/decree/2005-12-14/912/main"/&gt;     &lt;FRBRdate date="1963-09-07" name="Enactment"/&gt;     &lt;FRBRauthor href="#mdda" as="#author"/&gt;   &lt;/FRBRWork&gt; </pre>	<p>Metadata to identify the legislative document in a general way and independent from its version (work).</p>
<pre> &lt;FRBRExpression&gt;   &lt;FRBRthis value="/sv/decree/2005-12-14/912/esp@/main"/&gt;   &lt;FRBRuri value="/sv/decree/2005-12-14/912/esp@/"/&gt;   &lt;FRBRdate date="2011-01-10" name="Expression"/&gt;   &lt;FRBRauthor href="#palmirani" as="#editor"/&gt; &lt;/FRBRExpression&gt; </pre>	<p>Metadata to identify the version (expression). In this case it is an original Spanish version.</p>
<pre> &lt;FRBRManifestation&gt;   &lt;FRBRthis value="/sv/decree/2005-12-14/912/esp@/main.xml"/&gt;   &lt;FRBRuri value="/sv/decree/2005-12-14/912/esp@/main.akn"/&gt;   &lt;FRBRdate date="2011-01-11" name="XMLConversion"/&gt;   &lt;FRBRauthor href="#palmirani" as="#editor"/&gt; &lt;/FRBRManifestation&gt; &lt;/identification&gt; </pre>	<p>Metadata to identify the format (manifestation), in this case XML from the general and abstract document.</p>

Figure 77 – Example of the block identification.

These relationships are transversal and more common to XML files belonging to the same "family of objects." This way can be cited different translations of the same bill, linking all versions of a certain law, and to recover all manifestations of a particular variant.

### 13.2 *Detect the References*

The reference inside a document needs particular attention in order to identify the correct and complete URI. In case that it is incomplete, short or does not have an explicit reference for the end-user to search the main elements of the URI, he/she will be forced to resolve the ambiguity. This is an intellectual process that requires interpretation of the document's content and legal expertise. In the following case the text that cites the Act 604/1993 (Copyright Law of Panama).

```
<p>That by <ref id="ref1" href="/sv/ley/1993-07-20/604/main">Executive Order No. 604, of 15 July 1993</ref>, published in the Official Journal No. 150, Volume No. 320 of 16 August 1993, it was issued the Promotion and Protection of Intellectual Property Act;</p>
```

Figure 78 - Example of reference detection.

There are two types of normative references: static references and dynamic references.

Static references are those that relate to a particular document set, in a particular historical moment (the Constitution of 2000, the Finance Act of 2009, the table of drugs of 2007).

Static references are obtained by inserting at the end of the URI the date on which you want to get the URL for the document, preceded by the sign":

```
<ref id="ref2" href="/pm/ley/2008/72/main:2010">Ley 72 de 2008</ref>
```

Specific references to a certain version will be made by inserting the specific date preceded by the sign"@

```
<ref id="ref2" href="/pm/ley/2008/72/esp@2009-02-29">Ley 72 de 2008</ref>
```

Reference to the original version will be made by inserting only "@

```
<ref id="ref2" href="/pm/ley/2008/72/esp@">Ley 72 de 2008</ref>
```

In contrast, dynamic references are cited using only the part relating to the work, i.e. to general information about the digital resource:

```
<ref id="ref2" href="/pm/ley/2008/72/">Ley 72 de 2008</ref>
```

### 13.3 *Distinguish the Referencing Metadata*

All references coming from the document and built into other legislative documents are later collected in the References section.

```
<activeRef id="ra1" href="/sv/ley/1993-07-20/604/" showAs="Ley de derecho de autor"/>
<references source="#bungeni">
  <original id="ro1" href="/sv/decree/2005-12-14/912/" showAs="Original"/>
  <activeRef id="ra1" href="/sv/act/1993-07-20/604/" showAs="Copyright Law"/>
  <activeRef id="ra2" href="/sv/act/1994-02-24/799/" showAs="Industrial Law"/>
</references>
```

Figure 79 – Reference example.

### 13.4 **Represent Metadata of the Temporal Events**

Legislative acts and bills are subject to change over time. With this in mind, there is a specific metadata block with the task of recording every event that concerns the life of the document and its amendments, which allows subsequently following the trail of these important events in the life of a document.

`Lifecycle` blocks record every event that alters the text during the life of the document.

`Workflow` blocks record every event, usually administrative or procedural that, without changing the text of the document, determines a change of status. A bill passed in the assembly does not change its text, but largely adjusts its legal status.

### 13.5 **Identify Notes coming from the Author or Official Authority**

In a normative document we can find authorial and editorial notes. The authorial notes contained in the document are inserted by the competent authority (parliament, ministers, etc.). They often provide an authentic interpretation of the regulatory text or provide grouping elements that are important to understand the text. The following example shows the author's for note the publication of Art. 186, which was repealed.

```
<article id="art186">
  <num>Art. 186 <authorialNote id="ath3" marker="1" placement="inline">
    <p>*BEGINNING OF NOTE: Article 186 mentions a deadline for obtaining
    authorization, while Executive Order N° 799 extends that deadline. For this reason is
    transcribed verbatim Article 1 of the mentioned Act: Art. 1.-Extended until the 15th June 1994
    the provisions of Art. 186, of the Promotion and Protection of Intellectual Property Act, issued
    by Executive Order N° 604 of 15 July 1993, published in the Official Journal N° 150, Volume
    320, of 16 August 1993.
    D.L. N° 799, of 2 February 1994, published in the O.J. N° 56, Volume 322, of 21 March 1994.
    END OF NOTE.
  </p>
</authorialNote>
</num>
```

Figure 80 - Example of marginal notes authorialNote block.

Conversely, editorial notes are made by institutions (libraries, editors, etc.) who wish to include in the text subjective or doctrinal interpretations. Akoma Ntoso separates these two categories and therefore the interpretative notes, not those of the author, are listed in the metadata and are brought to the text with a pointer. The following example shows the numbering of notes (1) located in the text and the XML fragment where the note is attached to the text with the element `<noteRef>`.

<p>2. <u>Dominican Republic</u></p> <p><u>Act 66-07. 22 May 2007<sup>1</sup></u></p> <p>National Congress on behalf of the Republic</p>	<pre>&lt;dateDoc&gt;   &lt;span period="#e2"&gt;22 May 2007   &lt;noteRef marker="1" refersTo="editorialNote"   href="#n1"/&gt;   &lt;/span&gt; &lt;/dateDoc &gt;</pre>
---	---

Figure 81 - Example of noteRef block.

The note is then inserted at the footer and is tagged in the metadata with the element `<notes>` in order to differentiate it from the author's notes.



<sup>1</sup> Transmitted through a note verbale from the Permanent Mission of the Dominican Republic dated 23 October 2007 addressed to the Secretary-General. Original: Spanish.

```
<meta>
<notes source="#palmirani">
  <note id="n1">
    <p>(1) Trmitted through a note verbale from the Permanent Mission of the Dominican Republic
dated 23 October 2007 addressed to the Secretary-General. Original:Spanish</p>
  </note>
</notes>
</meta>
```

Figure 82 – Notes example.

Thus, if in the future we want to recover the text as it was approved by the assembly or parliament, we can remove all tags `note` and `noteRef`, thereby returning authority to the legal text. The characteristic of being able to separate legally enforceable elements from observations made by third parties is an important element of the Legal XML standard, especially for the long-term preservation of a document’s legal value. This tool actually prevents possible confusions between the metadata incorporated by actors with different political and legal powers.

## 14. How to Markup the Legal Semantic of Legislative Documents in XML

### 14.1 Detect the Semantic Elements of the text

Some objective metadata are pillars for the entire legal document: date of delivery, authority, date of commencement, date of publication, and source of publication are some examples in the legislative document; time of record, date of the debate in the debate documents, and judgment events, advocate name in the judgment document. Other semantic elements represent legal concepts in the text such as *quotedText*, *quotedStructure*, *scene*, *judge*, etc. These parts should be detected and carefully analyzed in order to gather their entire literal meaning and assign the correct legal meaning to each part of the document before undertaking the metadata markup. This information is marked up in the XML file in two different ways in subsequent steps, thus before beginning the legal analysis the expert should identify which technique will be used:

- a. To use **inline** elements: *quotedText* is an inline semantic element that expresses two sets of information: first it isolates a fragment of text that is a citation of another text; and second, it is part of a modification. For this reason *quotedText* is admitted only in the *mod* block. Therefore, to assign to a fragment of text the *quotedText* markup means more than simply quoting a text.

<p>Art. 2.- To be replaced the second paragraph of Art. 1, as follows:          “This law covers copyright, related rights and industrial property with regard to inventions, utility models, industrial designs, industrial or trade secrets and test data.”</p>	<pre>&lt;article id="art2"&gt;   &lt;num&gt;Art. 2.&lt;/num&gt;   &lt;clause id="art2-cls1"&gt;     &lt;content&gt;       &lt;p&gt;         &lt;mod id="mod2"&gt;           - To be replaced the &lt;ref id="ref3" href="/sv/act/1993-07-20/604/main#art1-cls2"&gt;second paragraph of Art. 1&lt;/ref&gt;, as follows:           “&lt;quotedText id="mod2-qtd1"&gt;             This law covers copyright, related rights and industrial property with regard to inventions, utility models, industrial designs, industrial or trade secrets and test data.&lt;/quotedText&gt;.”           &lt;/mod&gt;</pre>
---	---

	<pre> &lt;/p&gt; &lt;/content&gt; &lt;/clause&gt; &lt;/article&gt; </pre>
--	---

Figure 83 - Identification of metadata inline elements in the text.

Next, the legal expert qualifies the first and the second *quotedText* with special metadata inserted into the meta block, thus, assigning to it the role played in the modification n. 2.

METADATA LEVEL	TEXT LEVEL
<pre> &lt;analysis source="#bungeni"&gt;   &lt;activeModifications&gt;     &lt;textualMod type="substitution" id="am2"       incomplete="true"&gt;       &lt;source href="#mod2"/&gt;       &lt;destination href="/sv/act/1993-07-20/604/main#art1"/&gt;       &lt;new href="#mod2-qt1"/&gt;     &lt;/textualMod&gt;   &lt;/activeModifications&gt; &lt;/analysis&gt; </pre>	<pre> &lt;&lt;mod id="mod2"&gt;   - To be replaced the &lt;ref id="ref3" href="/sv/act/1993-07-20/604/main#art1- clsz"&gt;second paragraph of Art. 1&lt;/ref&gt;,   as follows:    "&lt;quotedText id="mod2-qt1"&gt;     This law     covers copyright, related rights and     industrial property with regard to     inventions, utility models, industrial     designs, industrial or trade secrets and     test data.&lt;/quotedText&gt;."   &lt;/mod&gt; </pre>

Figure 84 - Connection between text and metadata qualifications.

- b. To use directly and only meta elements in the meta block. It is the case of information included in publications that are printed in the header of the Official Gazette. The following example shows an Act published in the Official Gazette of Dominican Republic.

<p>2007    POST OFFICE (USE AND RENTAL    S.R.O. 18  OF PRIVATE   CALLER BOXES)</p> <p><b>COMMONWEALTH OF DOMINICA</b></p> <p>STATUTORY RULES AND ORDERS No. 18 of 2007</p> <p>(Gazetted 19<sup>th</sup> April, 2007.)</p> <p>Made by the Minister under section 3 of the Post Office  Ordinance, Cap 274.</p> <p>1. These Rules may be cited as the - <span style="float: right;"><small>Short title.</small></span></p> <p style="text-align: center;"><b>POST OFFICE (USE AND RENTAL OF PRIVATE  CALLER BOXES) RULES, 2007.</b></p> <p>2. (1) Private caller boxes shall be of four kinds and shall be <span style="float: right;"><small>Rental of boxes.</small></span>  rented to the public at the rates specified in the Schedule to these  Rules.</p> <p>(2) The renter of a private caller box shall pay the rent  yearly and in advance.</p>
---

Figure 85 - Publication metadata identification in the document.

This information is identified by the legal expert and later registered in the meta block (not in the text):

```
<publication name=" officialGazette " date="2007-04-19" number="18" showAs="Official Gazette"/>
```

Figure 86 - Markup of the publication information inside of the meta block

## 14.2 Analysis of the Provisions

The provisions of the text can be classified with particular qualifications according to the role that they play in the document. In the current version of Akoma Ntoso it is possible to qualify either modificatory provisions (*activeModifications* and *passiveModifications*) or judicial assertions.

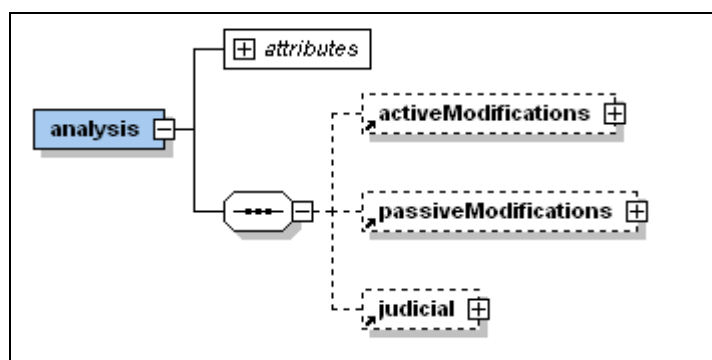


Figure 87 – Schema of the analysis

In this sense, we can add modification qualifications and also qualify the provisions of a judgment to represent dissent or support for the legal argumentation. The qualification of the provisions are represented in the meta block and connected to the corresponding part of the text using the identification mechanism.

The following example shows a modificatory qualification composed by different semantic information: action of modification, source, destination, and textual parts of the modification. In some cases there is also date of application of the modification, conditionals, duration of the modification (e.g. suspension) as primary specific elements.

<pre> &lt;analysis source="#palmirani"&gt;   &lt;activeModifications&gt;     &lt;textualMod type="substitution" id="am1" incomplete="false"&gt;       &lt;source href="#mod1"/&gt;       &lt;destination href="/sv/ley/1993-07-20/604/main#docTitle"/&gt;       &lt;new href="#mod1-qt1"/&gt;     &lt;/textualMod&gt;     &lt;textualMod type="insertion" id="am106" incomplete="false"&gt;       &lt;source href="#mod106"/&gt;       &lt;destination href="/sv/ley/1993-07-20/604/main#art184"/&gt;       &lt;new href="#mod106-qt1"/&gt;     &lt;/textualMod&gt;     &lt;textualMod type="repeal" id="am107" incomplete="false"&gt;       &lt;source href="#mod107"/&gt;       &lt;destination href="/sv/ley/1993-07-20/604/main#art186"/&gt;     &lt;/textualMod&gt;     &lt;efficacyMod type="inapplication" id="am109" incomplete="false"&gt;       &lt;source href="#mod109"/&gt;       &lt;destination href="/sv/ley/1994-02-24/799"/&gt;       &lt;duration period="#i2"/&gt;     &lt;/efficacyMod&gt;   &lt;/activeModifications&gt; &lt;/analysis&gt; </pre>	<p><b>Action:</b> substitution  <b>Source</b> of modification  <b>Destination</b> of modification  <b>Old</b> text  <b>New</b> text</p>
---	---

<pre> &lt;/efficacyMod&gt; &lt;/activeModifications&gt; &lt;/analysis&gt; </pre>	
--	--

Figure 88 - Example of judiciary qualification

### 14.3 *How to Markup in XML Consolidated Legislative Documents*

A consolidated document is a document that was built with modifications coming from various legislative documents.

The consolidated document should keep track of all amending events, of each consolidating note, and of every action undertaken in relation to other papers. We must, in other words, include the accurate, complete and timely information, so that a third actor can go back and verify the intellectual process of consolidation made by the editor.

First step. The consolidated text generates a version and, as mentioned above, changes its URI, adding at the end the date of the version.

```
<FRBRuri value="/sv/decreto/1993-07-15/604/esp@2006-01-20"/>
```

Second step. The block of events is enriched by new information noting when amendments have been made to the document. In this example, the event e2 records that on 20 January 2006 a change related to a document called rp1 was made.

<pre> &lt;lifecycle source="#palmirani"&gt;   &lt;event id="e1" date="1993-10-15" source="#ro1" type="generation"/&gt;   &lt;event id="e2" date="2006-01-20" source="#rp1" type="amendment"/&gt; &lt;/lifecycle&gt; </pre>
--

Figure 89 – Lifecycle example

Third step. In the block `references` it is defined what is rp1. With `passiveRef` we will define the document responsible for the event e2.

<pre> &lt;references source="#bungeni"&gt;   &lt;original id="ro1" href="/sv/ley/1993-07-15/604/" showAs="Original"/&gt;   &lt;passiveRef id="rp1" href="/sv/decreto/2005-12-14/912/" showAs="AMENDMENTS TO THE INTELLECTUAL PROPERTY LAW"/&gt; &lt;/references&gt; </pre>
--

Figure 90 – PassiveRef example

Fourth step. The modification action performed is defined.

<pre> &lt;analysis source="#palmirani"&gt;   &lt;passiveModifications&gt;     &lt;textualMod type="substitution" id="am2" incomplete="true"&gt;       &lt;source href="/sv/decreto/2005-12-14/912/main#mod2"/&gt;       &lt;destination href="#art1-cls2"/&gt;       &lt;new href="#span2"/&gt;     &lt;/textualMod&gt;   &lt;/passiveModifications&gt; &lt;/analysis&gt; </pre>
--

Figure 91 – Example of legal analysis of the modifications

And the corresponding explanatory note:

```

<notes source="#palmirani">
  <note id="n1">
    <p>(2) E.O. N° 912, of 14 December 2005, published in the O.J. N° 8, Volume 370, of 12 January
2006. </p>
  </note>
</notes>

```

Figure 92 – Note example

Fifth step. Enter in the body of the document the modified text, in order to distinguish it from the other parts of the text and to assign to it a different time interval (e2). The new text is also connected to the explanatory note defined in the metadata.

```

<clause id="art1-cls2">
  <content>
    <p>
      <span period="#e2">This law covers copyright, related rights and industrial property with regard to
inventions, utility models, industrial designs, industrial or trade secrets and test data. <noteRef
marker="1" refersTo="consolidationNote" href="#n1"/>
    </span>
    </p>
  </content>
</clause>

```

Figure 93 – Example of text update with connection to the notes

In summary, the updated part of the body links the various layers of metadata, which in turn have been defined separately. The separation is useful for three reasons: i) it separates the author's part from annotations that are subject to free interpretation; ii) it allows for multiple interpretations without having to point out the basic structure of the document, and iii) it avoids repetition in the metadata which is defined once and referred to several times in the text.

```

- <act contains="singleVersion">
  - <meta>
    - <identification source="#bungeni">
      + <FRBRWork>
      + <FRBRExpression>
      + <FRBRManifestation>
    </identification>
    <publication date="1993-08-16" name:
      showAs="Diario Oficial" />
    + <lifecycle source="#palmirani">
    + <analysis source="#palmirani">
    + <references source="#bungeni">
    + <notes source="#palmirani">
  </meta>
  + <preface>
  + <preamble>
  + <body>
  + <conclusions>
</act>
</akomaNtoso>

```

Figure 94 – Consolidated document tree.

## 14.4 ***How to Use the XML Files***

After the mark-up operation, it is possible to manage all the lifecycle of the legislative document in a digital way and to track each modification, connection, and semantic annotation made during the legislative process. To mark-up legislative documents is really costly, but the benefits are relevant:

- a. **Transparency and Monitoring:** each document can be tracked and any modification can be detected and connected with the author. In such a way it is possible to monitor the activities of the parliament, the productivities of the committees, and the argumentations of the outcome.
- b. **Quality of law and Effectiveness:** an information system based on a Legislative XML repository can monitor the quality of the law, minimize the errors during the drafting activities (e.g. check the normative reference), provide rapidly consolidated and updated versions of the documents, or produce a synoptic document with different versions of the same text.
- c. **Interoperability and Cooperation:** the legislative workflow is composed by within the different institutions, such as government, chambers, assembly, committees;
- d. **Semantic Web tools compliance:** These days, more and more we find that there are software, techniques and tools that foster the XML data and disseminate them in the Web. Linked Data community is an open data network where people share knowledge and information. The Library of Congress of Chile has a project for transforming the legal metadata in RDF format available in Linked Data network, in other words the legal metadata are now available in <http://datos.bcn.cl/portal/>. In this way other applications can reuse these metadata and the accessibility to the legal resources becomes easier. Open Gov is an USA initiative promoted by the President Obama in 2009 aimed to provide all the main important government data in open source, as for example raw data, available without any previous filter or manipulation. Also, the governments of UK and Australia promote the same approach.
- e. **Performance and Query.** The best way for fostering the XML peculiarities is to adopt a native XML database. Oracle provides functionalities for managing XML format, nevertheless, it does not completely and directly manage the XML tree nodes. A native XML database example is eXist, which provides a direct access to each XML structure and tag, it is open source, and it also permits to manage the XML file jointly with the full-text functionalities. With a native XML database it is possible to use a language of query able to detect the node of the XML tree (XPath, Xquery).

## **15. Conclusions**

This paper aims to illustrate the use of Legislative XML, with its technical and theoretical characteristics. It has also sought to provide a methodology for the analysis of the legal document, an activity that must necessarily precede the markup phase and that should be conducted by qualified personnel in the legal-legislative field.

Finally, we provided a scenario of possible software that can help operators use Legislative XML in the markup process without getting into the technological details and the syntax of XML language.

## Glossary

**BID.** It is the acronym of *Banco Interamericano de Desarrollo*. It is the largest source of development financing for Latin America and the Caribbean.

**Consolidated text** is any version of the modified original document.

**DSD** (Document Structure Description) is an XML Schema language co-developed by AT&T Labs - Research, NJ, and BRICS, University of Aarhus, Denmark. The goal of DSD is to provide schema syntax capable of strong data typing and context-dependent content models.

**DTD** (Document Type Definition) [<http://www.w3schools.com/dtd/default.asp>]: is the oldest of these languages and the only one that has been standardized as an official document within the XML language itself. DTD is simple, easy to understand, but unfortunately not very expressive.

**FRBR** (Functional Requirements for Bibliographic Records) [<http://www.ifla.org/publications/functional-requirements-for-bibliographic-records>] is a standard nomenclature of the IFLA (International Federation of Bibliographic Associations) that provides a basic framework for understanding and dealing with different ideas of documents that the public can enjoy.

**HTML.** It is the acronym of HyperText Markup Language and it is the markup language for writing the content (pages) in the Web. It was created by Tim Berners-Lee around 1994 and it became an IETF standard in 1995, with the RFC: <http://tools.ietf.org/html/rfc1866>

**Linked Data.** It is a method, based on the Semantic Web technology, promoted by Tim Berners-Lee for sharing information in the Web and increasing the reuse of open data, to make them interlinked and more useful for any further application.

**Modifier** is an original document that modifies other documents.

**Ontology.** In computer science, ontology is an organized collection of facts and assertions about a specific domain. Ontologies identify a number of classes and relevant concepts and their properties, and also the relationships between those classes. Within World Wide Web the discipline of ontology is having a wide spread and a huge success, thanks to an initiative called the W3C Semantic Web. Under this initiative, several languages have been defined, including RDF (Resource Description Framework) [<http://www.w3.org/standards/techs/rdf>], RDF Schema [<http://www.w3.org/TR/rdf-schema/>] and OWL [<http://www.w3.org/standards/techs/rdf>]. These languages allow to define specific ontologies, mixed and exchanged for a wide range of different purposes.

**PDF.** It is the acronym of Portable Document Format. It was a proprietary controlled by Adobe Acrobat and now is an open standard since 2008. It is a format oriented to describe the typographic information of the document. Some PDF are simply the representation of a scanned image not treatable by the machine.

**Plone.** Plone is a free and open source content management system built on top of the Zope application server. The basic language of developing is Python, but several components are developed also in Java. Plone has a strong eGov community and it is a mature product for document management.

**RELAX NG** schema specifies constraints and patterns for the structure and content of an XML document. It is an alternative respect DTD and XML-Schema. It was defined by a committee specification of the OASIS and it is part of ISO standards, it is a W3C standard. RELAX NG permits also a compact syntax, non-XML format, inspired by extended Backus-Naur form and regular expressions.

**Schematron** is a rule-based validation language for making assertions about the presence or absence of patterns in XML trees. It is a structural schema language expressed in XML using a small number of elements and XPath.

**UNDESA**. It is the acronym of United Nations Department of Economic and Social Affairs.

**URIs** (Uniform Resource Identifiers) [<http://www.w3.org/TR/uri-clarification/>] are the standard mechanisms defined in RFC (<http://tools.ietf.org/html/rfc3986>) to refer to documents, languages and concepts, and in general, resources on the World Wide Web. The URI includes two types of mechanisms and syntax: URL (Uniform Resource Locator) that represents the physical location of the resource on the WWW and URN (Uniform Resource Name) that represents the logical name of the resource in the WWW. All the WWW is based on the URI and this is a key component of the Semantic Web. Without a name, resources could not be linked on the network.

**URL**. It is the acronym of Unique Resource Locator and any URL is a particular type of URI. It is the standard naming convention in the Web for providing a name to the digital resources. It was created by Tim Berners-Lee in 1994 with the IETC RFC 1738: <http://www.ietf.org/rfc/rfc1738.txt>

**URN**. (Uniform Resource Name). An URN is a particular type of URI. It is a particular syntax for defining the logical, not physical, name of the digital resources on the Web. The logical name is defined using the main persistent metadata that qualify the digital resources (e.g. the technical specifications are defined by IETF RFC 1737: <http://tools.ietf.org/html/rfc1737>

**Version** every consolidated text is a new version, being V0 the original version.

**W3C**. It is the acronym of World Wide Web Consortium. It is one of the most important standardization body in charge of defining the technical specifications and regulations about the WWW.

**WYSISYG** means “What You See Is What You Get” and it is a characteristic of the software interface tools. This functionality allows seeing, in any moment of the elaboration, a document on the screen in a format very similar to the final outcome. An example of interface WYSISYG is Microsoft Word. Usually, the XML editors are not WYSISYG, but they present the pure XML code.

**XHTML** is the acronym of eXtensible HyperText Markup Language. It is the reformulation of the HTML 4.0 using the XML 1.0. This permits to have an extensible HTML and it is more rigorous, fostering the characteristic of the XML.

**XML** (eXtensible Markup Language) [<http://www.w3.org/XML/>] is a standard language for the document markup that is becoming the universal language chosen for a number of extremely different purposes, including presenting text on screen, in the Word Wide Web, on paper, etc.

**XML Schema** (sometimes abbreviated as XSD or XSDL) [<http://www.w3.org/standards/xml/schema>] is another standard proposed by the W3C for defining XML languages. While more detailed and difficult to read than the DTD schema, XML Schema is more expressive and more able to capture many aspects that escape to the DTD.

**XPath**. It is a technology belonging to the XML family languages. It is a standard for addressing and for manipulating the nodes of a XML file.

**Xquery**. It is a technology belonging to the XML family languages, being the abbreviation of XML Query Language. It is a standard language for writing queries in a SQL-like format, but applicable to XML files.



## Annexes

Sample text of a law passed in El Salvador and markup in Akoma Ntoso.

```
<?xml version="1.0" encoding="UTF-8"?>
<?xml-stylesheet type="text/xsl" href="/styles/elsalvador.xsl"?>
<akomaNtoso xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
xsi:schemaLocation="http://www.akomantoso.org/1.0 ./akomantoso10.xsd"
xmlns="http://www.akomantoso.org/1.0">
  <act contains="singleVersion">
    <meta>
      <identification source="#bungeni">
        <FRBRWork>
          <FRBRthis value="/sv/decree/1993-07-15/604/main"/>
          <FRBRuri value="/sv/decree/1993-07-15/604/main"/>
          <FRBRdate date="1993-07-15" name="Enactment"/>
          <FRBRauthor href="#mdda" as="#author"/>
        </FRBRWork>
        <FRBRExpression>
          <FRBRthis value="/sv/decree/1993-07-15/604/esp@2006-01-20/main"/>
          <FRBRuri value="/sv/decree/1993-07-15/604/esp@2006-01-20"/>
          <FRBRdate date="2011-01-10" name="Expression"/>
          <FRBRauthor href="#palmirani" as="#editor"/>
        </FRBRExpression>
        <FRBRManifestation>
          <FRBRthis value="/sv/decree/1993-07-15/604/esp@2006-01-20/main.xml"/>
          <FRBRuri value="/sv/decree/1993-07-15/604/esp@2006-01-20/main.akn"/>
          <FRBRdate date="2011-01-11" name="XMLConversion"/>
          <FRBRauthor href="#palmirani" as="#editor"/>
        </FRBRManifestation>
      </identification>
      <publication date="1993-08-16" name="Official Journal number 8, volume 370" showAs="Official
Journal"/>
      <lifecycle source="#palmirani">
        <event id="e1" date="1993-10-15" source="#ro1" type="generation"/>
        <event id="e2" date="2006-01-20" source="#rp1" type="amendment"/>
      </lifecycle>
      <workflow source="#palmirani">
        <step id="step1" date="1993-10-15" actor="#parliament" as="#legislator" outcome="#billpassed">
          <sv:proprietary source="#salvador">workflow of San Salvador</sv:proprietary>
        </step>
      </workflow>
      <analysis source="#palmirani">
        <passiveModifications>
          <textualMod type="substitution" id="am1" incomplete="false">
            <source href="/sv/decree/2005-12-14/912/main#mod1"/>
            <destination href="#docTitle"/>
            <destination href="#paragraph/docTitle"/>
            <new href="#span1"/>
          </textualMod>
          <textualMod type="substitution" id="am2" incomplete="true">
            <source href="/sv/decree/2005-12-14/912/main#mod2"/>
            <destination href="#art1-cls2"/>
            <new href="#span2"/>
          </textualMod>
          <textualMod type="substitution" id="am3" incomplete="false">
            <source href="/sv/decree/2005-12-14/912/main#mod3"/>
            <destination href="#art3"/>
            <new href="#span3"/>
          </textualMod>
          <textualMod type="substitution" id="am4" incomplete="false">
```

```

<source href="/sv/decree/2005-12-14/912/main#mod4"/>
<destination href="#title2"/>
<new href="#span4"/>
</textualMod>
<textualMod type="substitution" id="am5" incomplete="false">
<source href="/sv/decree/2005-12-14/912/#mod5"/>
<destination href="#art4"/>
<new href="#span5"/>
</textualMod>
<textualMod type="substitution" id="am6" incomplete="false">
<source href="/sv/decree/2005-12-14/912/#mod6"/>
<destination href="#art5"/>
<new href="#span6"/>
</textualMod>
<textualMod type="substitution" id="am7" incomplete="false">
<source href="/sv/decree/2005-12-14/912/#mod7"/>
<destination href="#art7"/>
<new href="#span7"/>
</textualMod>
<textualMod type="insertion" id="am106" incomplete="false">
<source href="/sv/decree/2005-12-14/912/#mod106"/>
<destination href="#art184"/>
<new href="#span106"/>
</textualMod>
<textualMod type="repeal" id="am107" incomplete="false">
<source href="#mod107"/>
<destination href="#art186"/>
</textualMod>
</passiveModifications>
</analysis>
<references source="#bungeni">
<original id="ro1" href="/sv/ley/1993-07-15/604/" showAs="Original"/>
<passiveRef id="rp1" href="/sv/decree/2005-12-14/912/" showAs="AMENDMENTS TO THE
INTELLECTUAL PROPERTY LAW"/>
<TLCRole id="president" href="/ontology/organizations/sv/president" showAs="President of the
Republic"/>
<TLCRole id="pv" href="/ontology/organizations/sv/firstVicepresident"
showAs="FirstVicepresident"/>
<TLCRole id="tv" href="/ontology/organizations/sv/thirdVicepresident"
showAs="ThirdVicepresident"/>
<TLCRole id="ps" href="/ontology/organizations/sv/thirdSecretary" showAs="First SECRETARY"/>
<TLCRole id="ts" href="/ontology/organizations/sv/fourthSecretary" showAs="Third
SECRETARY"/>
<TLCRole id="qs" href="/ontology/organizations/sv/firstVicepresident" showAs="Fourth
SECRETARY"/>
<TLCRole id="author" href="/ontology/roles/sv/author" showAs="Author of Document"/>
<TLCRole id="editor" href="/ontology/roles/ita/editor" showAs="Editor of Document"/>
<TLCOrganization id="bungeni" href="/ontology/organization/ken/bungeni" showAs="Bungeni"/>
<TLCPerson id="Zepeda" href="/ontology/persons/sv/editors/zepeda" showAs="CIRO CRUZ
ZEPEDA PEÑA"/>
<TLCPerson id="Henirquez" href="/ontology/persons/sv/authority/Henirquez" showAs="JOSÉ
MANUEL MELGAR HENRÍQUEZ"/>
<TLCPerson id="Lopez" href="/ontology/persons/sv/authority/cervone" showAs="JOSÉ
FRANCISCO MERINO LÓPEZ"/>
<TLCPerson id="Decuellar" href="/ontology/persons/sv/authority/Lopez" showAs="MARTA LILIAN
COTO VDA. DE CUÉLLAR"/>
<TLCPerson id="Rivas" href="/ontology/persons/sv/authority/Rivas" showAs="JOSÉ ANTONIO
ALMENDÁRIZ RIVAS"/>
<TLCPerson id="Escalante" href="/ontology/persons/sv/authority/Escalante" showAs="ELVIA
VIOLETA MENJÍVAR ESCALANTE"/>
<TLCPerson id="palmirani" href="/ontology/persons/ita/editors/palmirani" showAs="Monica
Palmirani"/>

```

```

</references>
<notes source="#palmirani">
  <note id="n1">
    <p>(2) E. O. N° 912, of 14 December 2005, published in the O. J. N° 8, Volume 370, of 12
January 2006. </p>
  </note>
</notes>
</meta>
<preface>
  <subdivision>
    <p>
      <docTitle>
        <span period="#e2"> INTELLECTUAL PROPERTY LAW<noteRef marker="1"
refersTo="consolidationNote" href="#n1"/>
        </span>
      </docTitle>
      <docType>Executive Order</docType>
      <docNumber>No. 912</docNumber>, <docDate date="2005-12-14">of 14 December
2005</docDate>
      <docProponent>LEGISLATIVE ASSEMBLY OF EL SALVADOR,</docProponent>

          Decree number 604, of 15 July 1993.
          The 1993 Promotion and Protection of Intellectual Property Act
          (Published in the Official Journal number 150 volume 320 of 16 August
1993)

          Amended by the Executive Order number 912 of 14 December 2005
          (Published in the Official Journal number 8, volume 370 of 12 January
2006,

          changing its name to Intellectual Property Law.)

    </p>
  </subdivision>
</preface>
<preamble>
  <subdivision>
    <p class="centered">CONSIDERING:</p>
    <list id="lst1">
      <item id="lst1-itm1">
        <num>I.</num>
        <p> That the second paragraph of Article 103 of the Constitution recognizes intellectual and
artistic property, for the time and in the manner determined by the Law;
</p>
      </item>
      <item id="lst1-itm2">
        <num>II.</num>
        <p> That the third paragraph of Article 110 of the Constitution states that may be granted
privileges for a limited time to inventors, discoverers and improvers of production processes;</p>
      </item>
      <item id="lst1-itm3">
        <num>III.</num>
        <p>That in view of the development achieved by such materials, it is necessary to enact
new legislation in order to protect and regulate important aspects such as, among others, collective
management, the protection of utility models, industrial designs, trade and commercial secrets that existing
legislation does not include; </p>
      </item>
      <item id="lst1-itm4">
        <num>IV.</num>
        <p>That both Literary, Artistic, and Scientific as well as Industrial Property are the two
branches forming the Intellectual Property, so that all provisions that govern such matters can meet in a
single legal body;
</p>
      </item>
    </list>

```

```

<p class="centered">THEREFORE,</p>
<p>in exercise of its constitutional powers and by initiative of the President, through the Ministers of
Finance and Justice and Members of Parliament Raul Manuel Somoza Alfaro, Gerardo Antonio Suvillaga,
Santiago Vicente Di-Majo, Miriam Eleana Dolores Mixco Reyna, Jorge Alberto Carranza, Rafael Antonio
Morán Orellana y Marcos Alfredo Valladares Melgar, </p>
<p class="centered">DECREE the following:</p>
</subdivision>
</preamble>
<body>
<paragraph id="prg1">
<content>
<p>
<docTitle>INTELLECTUAL PROPERTY LAW<noteRef marker="1"
refersTo="consolidationNote" href="#n1"/>
</docTitle>
</p>
</content>
</paragraph>
<title id="tlt1">
<num>TITLE ONE </num>
<chapter id="chp1">
<num>CHAPTER ONE </num>
<heading>PRELIMINARY PROVISIONS</heading>
<article id="art1">
<num>Art.1</num>
<clause id="art1-cls1">
<content>
<p>
The provisions contained in this Act are intended to ensure an adequate and effective
protection of intellectual property, laying the foundations to promote, encourage and protect it.
</p>
</content>
</clause>
<clause id="art1-cls2">
<content>
<p>
<span period="#e2">This law covers copyright, related rights and
industrial property with regard to inventions, utility models, industrial designs, industrial or trade secrets and
test data. <noteRef marker="1" refersTo="consolidationNote" href="#n1"/>
</span>
</p>
</content>
</clause>
</article>
<article id="art2">
<num>Art. 2.</num>
<clause id="art2-cls1">
<content>
<p>
In case of conflict, shall take precedence over the provisions of this
Act, those contained in international treaties and conventions ratified by El Salvador. </p>
</content>
</clause>
</article>
<article id="art3">
<num>Art. 3.</num>
<clause id="art3-cls1">
<content>
<p>
<span period="#e2">
This law will not apply to trademarks, trade names and advertising slogans or signs trade, which are
governed by the Law on Trademarks and Other Distinctive Signs. <noteRef marker="1"

```

```

refersTo="consolidationNote" href="#n1"/>
    </span>
  </p>
</content>
</clause>
</article>
</chapter>
</title>
<title id="tit2">
  <num>TITLE TWO</num>
  <heading>ARTISTIC OR LITERARY PROPERTY </heading>
  <chapter id="chp2">
    <num>CHAPTER I</num>
    <heading> - NATURE AND SUBJECT</heading>
    <article id="art4">
      <num>Art. 4.</num>
      <clause id="art4-cls1">
        <content>
          <p>
            <span period="#e2">
The author of a literary or artistic work, shall have an exclusive property right over it, which is called
copyright. <noteRef marker="1" refersTo="consolidationNote" href="#n1"/>
            </span>
          </p>
        </content>
      </clause>
    </article>
    <article id="art5">
      <num>Art. 5.
</num>
      <clause id="art5-cls1">
        <content>
          <p>
            <span period="#e2">
Copyright shall include prerogatives of abstract, intellectual and moral order that constitute the moral
right; and patrimonial powers that constitute the economic right.
<noteRef marker="1" refersTo="consolidationNote" href="#n1"/>
            </span>
          </p>
        </content>
      </clause>
    </article>
    <article id="art6">
      <num>Art. 6.</num>
      <clause id="art6-cls1">
        <content>
          <p>
The author's moral right is imprescriptible and inalienable and shall include the following prerogatives:</p>
            <list id="art6-cls1-lst1">
              <item id="art6-cls1-lst1-itma">
                <num>a)</num>
                <p>To publish his work in the form, way, and manner as he
deems necessary; </p>
              </item>
              <item id="art6-cls1-lst1-itmb">
                <num>b)</num>
                <p>To withhold your name or use a pseudonym on his
publications; </p>
              </item>
              <item id="art6-cls1-lst1-itmc">
                <num>c)</num>

```

work unpublished; </p>

<p>To destroy, rebuild, retain or keep the

</item>

<item id="art6-cls1-lst1-itmd">

<num>d)</num>

<p>To withdraw or recover, change or amend the work after it has been disclosed, but this power may not be exercised without compensating the owner of their rights for damages that this will cause. This right shall expire with the death of the author;

</p>

</item>

<item id="art6-cls1-lst1-itme">

<num>e)</num>

<p>To preserve and claim the authorship of the work;</p>

</item>

<item id="art6-cls1-lst1-itmf">

<num>f)</num>

<p>To oppose the plagiarism of the work; </p>

</item>

<item id="art6-cls1-lst1-itmg">

<num>g)</num>

<p>To demand that his name or pseudonym be published in each issue of the work or be mentioned in every act of public communication of the work; </p>

</item>

<item id="art6-cls1-lst1-itmh">

<num>h)</num>

<p>To oppose his name or pseudonym appearing on the work of a third party or on a work that has been disfigured; </p>

</item>

<item id="art6-cls1-lst1-itmi">

<num>i)</num>

<p>To safeguard the integrity of the work opposing to any distortion, mutilation, alteration or abridgment of the work or its title, even against the acquirer of the material object of the work; and</p>

</item>

<item id="art6-cls1-lst1-itmj">

<num>j)</num>

<p>To oppose any use of the work to the detriment of his honor or reputation as an author.

</p>

</item>

</list>

</content>

</clause>

</article>

<article id="art7">

<num>Art. 7.</num>

<clause id="art7-cls1" period="#e2">

<content>

<p>

<span period="#e2">

The author's economic right is the exclusive right to authorize or prohibit the use of his works, as well as the ability to derive economic benefit from the use of the works, and includes the following faculties in particular:

</span>

</p>

<list id="art7-cls1-lst1">

<item id="art7-cls1-lst1-itma">

<num>a)</num>

<p>

<span period="#e2">To reproduce the work, fixing it materially by any procedure that allows communication to the public in an indirect and durable manner, or to obtain copies of the entire work or any part thereof, may be effected by means of mechanical

reproduction, such as printing, lithography, poligraph, cinematography, phonographic, tape recordings, photographs and any other means of fixing; it also includes the reproduction of improvisations, speeches, readings and in general all public recitations by means of stenography, typewriting and similar procedures; as well includes the power to prohibit all reproductions of the work in any manner or form permanent or temporary, including temporary storage in electronic form; (2)

</span>

</p>

</item>

<item id="art7-cls1-lst1-itmb">

<num>b)</num>

<p><span period="#e2">To execute and perform the work

composed expressly for that purpose, communicating it to the public direct and immediately, such as theatrical representation, musical and choreographic performance, cinematographic and television dramatization, and the preparation of any other form of public spectacle; (2)

</span>

</p>

</item>

<item id="art7-cls1-lst1-itmc">

<num>c)</num>

<p><span period="#e2">To spread the work by any means

serving to transmit sounds and images, such as telephone, radio, television, cable, teleprinter, satellite or any other means already known or to be developed in the future; (2)

</span>

</p>

</item>

<item id="art7-cls1-lst1-itmd">

<num>d)</num>

<p><span period="#e2">The distribution of the work, that

is, to make available to the public copies of the work through sale or other form of transferring the ownership, but when the marketing of copies takes place by way of sale, this power extinguishes after the first sale, except in the case of some legal exceptions; preserving the owner of the patrimonial rights, the right to authorize or prohibit the hiring of such copies, as well as to modify, publicly display and reproduce the work; (2)

</span>

</p>

</item>

<item id="art7-cls1-lst1-itme">

<num>e)</num>

<p><span period="#e2"> To import, export or authorize the

import or export of copies of his works lawfully manufactured and prevent the import or export of illegally manufactured copies; and (2)

</span>

</p>

</item>

<item id="art7-cls1-lst1-itmf">

<num>f)</num>

<p><span period="#e2">The public communication of the

work.<noteRef marker="1" refersTo="consolidationNote" href="#n1"/></span>

</p>

</item>

</list>

</content>

</clause>

</article>

</chapter>

</title>

<title id="tit4">

<num>TITTLE FIVE </num>

<chapter id="tit5-chp1">

<num>CHAPTER II</num>

<heading>OF THE INVENTIONS</heading>

<article id="art184A">

```

<num>Art. 184A.</num>
<clause id="art184A-cls1">
  <content>
    <p>
      <span period="#e2">For the purposes of this Act, means the
Register, the Intellectual Property Registry. <noteRef marker="1" refersTo="consolidationNote"
href="#n1"/></span>
    </p>
  </content>
</clause>
</article>
<article id="art186">
  <num>Art. 186 <authorialNote id="ath3" marker="1" placement="inline">
    <p>*BEGINNING OF NOTE: Article 186 mentions a deadline in order to
obtain authorization, the Executive Order No. 799, extends the deadline, and for this reason is transcribed
verbatim Article 1 of the mentioned Executive Order: Art. 1.-Extended until June 15 1994, the provisions
of Article 186 of the Promotion and Protection of Intellectual Property Act, issued by Executive
Order No. 604 of July 15, 1993, published in the Official Journal No. 150, Volume 320,
dated 16 August 1993.
E.O. N° 799, of 2 February 1994, published in the O.J. N° 56, Volme 322, of 21 March 1994.
END OF NOTE.
</p>
  </authorialNote>
</num>
<clause id="art186-cls1">
  <content>
    <p>
      <span period="#e2">Repealed. <noteRef marker="1"
refersTo="consolidationNote" href="#n1"/></span>
    </p>
  </content>
</clause>
</article>
</chapter>
</title>
</body>
<conclusions>
  <p>ENACTED IN THE BLUE ROOM, LEGISLATIVE PALACE: San Salvador, on the fourteenth day
of December of year two thousand five.</p>
  <p refersTo="#Zepeda">CIRO CRUZ ZEPEDA PEÑA</p>
  <p refersTo="#president">PRESIDENT</p>
  <p refersTo="#Herniquez">JOSÉ MANUEL MELGAR HENRÍQUEZ</p>
  <p refersTo="#vp">FIRST VICEPRESIDENT</p>
  <p refersTo="#Lopez">JOSÉ FRANCISCO MERINO LÓPEZ</p>
  <p refersTo="#vp">THIRD VICEPRESIDENT</p>
</conclusions>
</act>
</akomaNtoso>

```



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